Northeastern University

Graduate Catalog
2017–2018

Table of Contents

General Admission and Transfer Credit

Regulations Applying to All Degree Programs

A copy of each graduate degree program as approved by the Board of Trustees and as officially amended is on file in the Office of the Provost. This record contains the goals of all requirements for the program. All descriptions of the program in the university, college, and department publications must conform to this officially approved record. Descriptions of PlusOne programs are also on file in the provost's office.

Standards of admission are specific to certificate and degree programs.

Admission Requirements

Prior to beginning a graduate program, students must meet one of the following conditions:

- Have received a bachelor's degree or equivalent from an accredited college or university
- Have received a master's degree or equivalent degree from an accredited college or university
- Have received a first professional or equivalent degree from an accredited college or university
- Have been accepted into an approved bachelor's-to-graduate-degree program

Registration

Northeastern University has a policy of continuous registration while enrolled full-time in a graduate degree program.

All students must register for course work, research, thesis, dissertation, or continuation courses for each semester in order to be in good standing in the program. Registration is continuous with the exception of summer. A student must be registered in summer only if he or she will be graduating in the summer or holds an award that requires registration. Students must be registered during the semester in which they complete all requirements for their degree.

When circumstances warrant, e.g., medical exigency, a student may seek a leave of absence.

The university parental leave policy is available in the University Policies section of the Office of the Provost (https://provost.northeastern.edu/policies) website.

Transfer Credit

A maximum of 9 semester hours of credit (or 12 quarter hours) obtained at another institution may be accepted toward the degree, provided the credits consist of work taken at the graduate level for graduate credit, carry grades of 3.000 or better, have been earned at an accredited institution, and have not been used toward any baccalaureate or advanced degree or certificate at another institution.

Transfer credits must be no more than five academic years old at the time the student is admitted to graduate study. Courses older than five years will be accepted only in rare circumstances.

Grades earned in transferred credits are not counted as part of the overall grade-point average earned at Northeastern.

Transfer credits will only be accepted at the discretion of the academic department and the college's graduate office.

Note: The College of Professional Studies' (CPS) transfer policy (p. 274) is available in the CPS section of the catalog.

Special Student Status

Those students who are not pursuing a specific degree program are classified as special students. Special students must satisfy the requirements for admission and perform at a satisfactory level in course work in order to continue as special students. Performance of a special student in graduate courses should average at least 3.000 in order for the student to be allowed to register for any subsequent classes. The number of credits that may be earned by a student enrolled as a special student is at the discretion of each graduate office. However, only a maximum of 12 graduate semester hours may be applied to a graduate program. Students interested in pursuing a degree program must make a formal application to the degree program. Special students who do not register for four consecutive semesters, excluding summer semester, will be subject to review and possible withdrawal.

Special students are not eligible for Northeastern financial aid awards or federal financial aid.

Provisional Student Status

Provisional students are students whose academic records do not qualify them for acceptance as regular students. Provisional students must obtain a 3.000 grade-point average in the first 9 semester hours of graduate courses in order to continue in the graduate program or meet specifically delineated departmental requirements to qualify for full acceptance to a degree program. Students may not earn more than 9 semester hours while enrolled in provisional status. After the completion of 9 semester hours, students must either satisfy regular admission standards or be denied further registration in the graduate program.

Provisional students are not eligible for Northeastern financial aid awards or federal financial aid.

International students cannot be admitted provisionally or conditionally.

Undergraduate Credit for Graduate Courses

Undergraduate students who are juniors or seniors may enroll in graduate courses for credit toward their undergraduate degrees if they meet all prerequisites as determined by the graduate director and they receive

permission from the instructor of the course and from the student's undergraduate academic advisor.

Inter- and Intracollege Graduate Courses

In colleges that have a graduate school, units within the college that do not offer graduate degree programs may offer a maximum of two courses per year if the courses are approved within a unit or units offering a graduate degree program. These courses will be subject to the same review process as other graduate courses.

University-Mandated Training

All students must fulfill all university-mandated ethics and safety training.

Regulations Applying only to Doctor of Philosophy (PhD) Programs

Committee in Charge of the Graduate Student's Degree Program

The committee in charge of the graduate student's degree program is that body charged with overseeing all academic and administrative matters relating to the program. This committee will be a departmental or, in the case of colleges without departments, a college committee.

PhD Dissertation Committees

No dissertation committee shall have fewer than three faculty members, two of whom shall be from Northeastern University. The chair of the dissertation committee will be a full-time tenured or tenure-track member of the faculty of Northeastern University and will hold an appropriate doctorate. A research faculty member may chair a dissertation committee if he or she holds an appropriate doctorate and has received the approval to do so from the tenured and tenure-track faculty members of the unit(s) in which his or her appointment resides.

If a student's major advisor leaves Northeastern, that person may continue the research direction of the dissertation or thesis. However, a co-advisor must be appointed from the academic department or program. The student will then have two advisors, one an official member of the Northeastern faculty who will be available for research and administrative matters and the ex-Northeastern advisor. If a new major advisor is appointed, the ex-Northeastern faculty member may serve as an outside member of the committee.

The PhD committee should be appointed early enough to advise in the formulation of the student's program and in refining the research topic for the dissertation. Within the constraints of the above criteria, the PhD program faculty will determine the process by which dissertation committees are established. The final list of dissertation committee members shall be reported to the associate dean for graduate education.

Each PhD student shall have an annual review of his or her progress toward the degree. A copy of the review shall be submitted to the student.

After reaching candidacy, students must register for Dissertation for a minimum of two semesters in order to fulfill their formal residency requirement. Continuation status enrollment is for students who are postcandidacy, have completed all course work, and are actively engaged in completing a thesis or dissertation.

General Regulations and Requirements for Nondegree Certificate Programs

Certificates That Appear on the Transcript

DEFINITION

A nondegree certificate program is a program of study requiring at least four graduate courses, or 12 semester hours of graduate credit, but no more than 30 semester hours of graduate credit. In the College of Professional Studies (CPS), the number of credits for a certificate varies from 16 quarter hours to 30 quarter hours. Successful completion of such a certificate program will be recorded on the student's transcript. Appropriate graduate credits taken as part of a nondegree certificate program may be counted toward a regular graduate degree at the discretion of the committee in charge of the graduate program.

ADMISSION

All students admitted to a certificate program must satisfy the general requirements for admission as a graduate student and the requirements for the specific certificate program.

PROCEDURES FOR THE APPROVAL OF NEW CERTIFICATE PROGRAMS

New certificate programs are developed following the procedure outlined in the Guidelines for New Degree Programs found on the Office of the Provost (http://www.northeastern.edu/provost/policies) website.

PROCEDURES FOR CERTIFICATE PROGRAM REVIEW

Certificate programs will be reviewed in the context of departmental reviews. Information about these reviews can be found on the Office of the Provost (http://www.northeastern.edu/provost/policies) website.

GENERAL REGULATIONS

Except as indicated herein, certificate programs shall be subject to the same regulations and procedures as master's degree programs.

Course Programs That Do Not Appear on the Transcript

Colleges offering graduate programs may choose to recognize the completion of sequences of courses requiring fewer courses than a certificate program. No such recognition shall be placed on the student's transcript. Such a nontranscript program shall not involve more than four graduate courses or 12 semester hours of graduate credit. The requirements of any such nontranscript program will be forwarded to the vice provost for graduate education for record-keeping purposes.

General Regulations and Requirements for the Master's Degree

Admission

All students admitted to a master's program must satisfy the general requirements for admission as a graduate student and the requirements for the specific master's program.

Academic Classifications

Those students who have a bachelor's degree from an accredited college or university and satisfy the admissions requirements of the appropriate graduate school are classified as regular students. Domestic students whose records are not of acceptable quality may be accepted as provisional students. International students cannot be accepted provisionally. Provisional students must obtain a 3.000 grade-point average in the first 9 semester hours or otherwise fulfill the delineated departmental requirements to continue in the graduate program; they then become regular students. Any student whose record is not satisfactory may be dropped by action of the committee in charge of the degree program.

Course Requirements

A candidate for the master's degree must satisfactorily complete an approved program conforming to the requirements of the graduate school and department or program in which the candidate is registered.

The requirements for the master's degree are a minimum of 30 semester hours of graduate work beyond the bachelor's degree, except in the College of Professional Studies, in which 45 quarter hours of graduate work are required. There may also be other study required by the graduate school and department or program concerned. Students enrolled in a PlusOne program will be allowed to double-count prescribed graduate courses as part of their undergraduate degree.

Language Requirement

The committee in charge of the degree program may establish a language requirement.

Comprehensive Examination

At the discretion of the committee in charge of the degree program, final written or oral comprehensive examination(s) may be required. Such examinations will be given at least two weeks before the Commencement at which the degree is to be awarded.

Thesis

If a thesis is required in partial fulfillment of degree requirements, it must show independent work based, in part, on original material and must meet the approval of the student's thesis committee. The committee in charge of the degree program is responsible for providing instructions concerning preparation of the thesis.

The student must submit the thesis to ProQuest in sufficient time to allow for acceptance before the Commencement clearance deadline. Information on archiving a thesis with ProQuest is available in the program-relevant graduate office.

Time Limitation

Course credits earned in the program of graduate study, or accepted by transfer, are valid for a maximum of seven years unless the relevant graduate office grants an extension.

General Regulations and Requirements for the Certificate of Advanced Graduate Study

The Certificate of Advanced Graduate Study (CAGS) provides specialized study above the master's degree. It is a course of study that falls between the master's and doctoral degree and culminates in a graduate certificate.

Admission

An applicant for the CAGS must hold a master's degree in a related field from an accredited institution and must complete the admission procedure described in the material of the graduate school. All students admitted to a CAGS program must satisfy the general requirements for admission as a graduate student and the requirements for the specific CAGS program.

Academic Classifications and Degree Candidacy

Students admitted to a CAGS program will be designated as candidates for the Certificate of Advanced Graduate Study.

Course Requirements

A candidate for the CAGS must satisfactorily complete an approved program conforming to the requirements of the graduate school and department or program in which the candidate is registered. The candidate must complete a minimum of 24 semester hours or, in the case of the College of Professional Studies, 32 quarter hours of credit beyond the master's degree.

Time Limitation

Course credits earned in the program of graduate study, or accepted by transfer, are valid for a maximum of seven years unless the relevant graduate office grants an extension.

General Regulations and Requirements for the Research Doctorate (PhD and EdD)

The formal requirements for the PhD degree are the following:

- Completion of the course work mandated by the individual degree program.
- Fulfillment of the residency requirement.
- Formal training in the Responsible Conduct of Research (http://ori.hhs.gov/sites/default/files/rcrintro.pdf) for students as appropriate.
- A comprehensive examination or equivalent if required by the degree program.
- Continuous registration.
- A final examination conducted by the student's PhD committee.
- Submission of a dissertation to the relevant graduate office and to ProQuest for archiving. The dissertation must be based on original and independent research.

Admission

All students admitted to a doctor of philosophy program must satisfy the general requirements for admission as a graduate student and the requirements for the specific PhD program.

Academic Classification and Degree Candidacy

DOCTORAL STUDENT

Students in this classification have been admitted to a doctoral program.

DOCTORAL CANDIDATE

Every degree program shall have a policy defining candidacy. Students in this classification will have completed all departmental, college, and university requirements except for the dissertation. These requirements vary by program but minimally include completion of approximately 30 semester hours of acceptable graduate work beyond the bachelor's degree or possession of a previously earned master's degree that is acceptable to the department and certified by the graduate office. The requirements frequently include a comprehensive examination or a proposal defense.

Residence

Every degree program shall have a policy defining residency for candidates for doctoral degrees. The committee in charge of the degree program defines residency and specifies the method by which any residence requirement is satisfied.

Course Requirements

The program committee in charge of the degree program specifies the doctoral course requirements.

Language Requirements

The committee in charge of the degree program establishes the nature of the language requirement, if any.

Responsible Conduct of Research

By the end of their third year, all doctoral students for whom the Responsible Conduct of Research training is required must have completed this training. Training sessions are highly recommended for all doctoral students. The Office of the Vice Provost for Research is responsible for ensuring that appropriate training is available for doctoral students.

Qualifying Examination(s)

In departments that require qualifying examinations, students must be notified in writing of the nature and regulations governing these examinations and of how their performance on the examinations will affect their normal progress toward the degree. The graduate office should be made aware of the department regulations concerning such examinations.

Comprehensive Examination(s)

Degree programs may require a comprehensive examination as the final step before becoming a PhD candidate. The purpose of this examination(s) is to test the knowledge and skills of the student in a particular area and his or her knowledge of recent research developments in the field. The PhD program faculty will determine the process by which comprehensive examination committees are established.

Dissertation

Candidates for the degree of Doctor of Philosophy must complete a dissertation that embodies the results of extended research and makes an original contribution to the field. This work should give evidence of the candidate's ability to carry out independent investigation and to interpret in a logical manner the results of the research. The committee in charge of the degree program establishes the method of approval of the dissertation.

Candidates for the degree of Doctor of Education must complete a dissertation that embodies the results of extended, creative, and independent research and proper evaluation and interpretation of the results. The committee in charge of the degree program establishes the method of approval of the dissertation.

Final Oral Examination and Submission of Dissertation

The final oral examination will be carried out after the completion of all other requirements of the degree. The final oral examination will be on the subject matter of the doctoral dissertation and significant developments in the field of the dissertation. Other fields may be included if recommended by the examining committee.

Students must have completed all degree conferral requirements (including having successfully defended their thesis and having submitted their approved thesis as required by the department and to ProQuest) by the last day of the final exam period in order to be graduated in that semester. Graduate students must be continuously enrolled through the end of the term in which they have successfully completed all degree conferral requirements.

Time Limitation

After the establishment of degree candidacy, a maximum of five years will be allowed for the completion of the degree requirements. Under extenuating circumstances, a student may request an extension of this time frame.

General Regulations and Requirements for Interdisciplinary Graduate Degrees

Northeastern University offers individually designed and ongoing interdisciplinary graduate programs. The individually designed program is for the student who wishes to pursue graduate studies in an area that substantially overlaps two or more units. In such cases, that student may design, in consultation with his or her faculty advisor(s), an interdisciplinary program. The program will correspond in scope and depth to Northeastern's established degree standards but need not agree exactly with the regulations of individual units. There are also ongoing programs for students who wish to pursue graduate studies in areas in which two or more units have jointly established a graduate program. As with individually designed programs, ongoing programs correspond in scope and depth to Northeastern's established degree standards but do not agree exactly with the regulations of individual units.

The general regulations and requirements for graduate programs apply to interdisciplinary programs. Additional regulations and requirements are stated below.

Admission

UNIVERSITY-APPROVED INTERDISCIPLINARY PROGRAMS

Ongoing interdisciplinary programs are university-approved programs in areas of study that combine study in two or more units.

Each interdisciplinary graduate program shall be managed as established in the approved design of the program. All interdisciplinary programs, both master's and PhD, shall identify a committee with representation from all of the units involved to oversee the administration of the program in accordance with the guidelines established above. All administrative details, including but not limited to admission, probation notification, and graduation clearance, shall be carried out by the registration unit. Curriculum design and any subsequent modifications to a program shall be approved by the established procedures within all of the units involved.

INDIVIDUALLY DESIGNED INTERDISCIPLINARY PROGRAMS

In order to pursue an individually designed interdisciplinary graduate program, a student must have been accepted into an approved graduate program that will serve as the registration unit for the interdisciplinary program.

Successful application for admission to an individually designed interdisciplinary program consists of a carefully thought-out, written proposal describing the areas of proposed study and research. Part of this proposal will be a list of courses to be taken; a description of the qualifying and comprehensive examination process to be used, if any; a timeline; and any other requirements of the program. This proposal must be designed and prepared in consultation with a terminally prepared faculty member at Northeastern University. In the case of an interdisciplinary PhD proposal, this faculty member must meet the qualifications defined in the section on PhD Dissertation Committees (p. 10). At least two units must be participating in order for the proposal to be deemed interdisciplinary. The proposal must correspond in scope and depth to Northeastern's established degree standards. All of the units and the associate dean(s) for graduate education of the participating college(s) must approve the proposal. Approval of the proposal indicates that appropriate curricular and other academic norms for the specified degree are satisfied. A proposal for a PhD must define an area of study in which original and independent research can take place.

Admission of the student to the interdisciplinary program of study requires favorable recommendation by all units involved, including the registration unit. It also requires the commitment by a faculty member at Northeastern University to be the advisor of the student and chair of the interdisciplinary committee for the student. In the case of an interdisciplinary PhD program, this faculty member must meet the qualifications defined in the section on PhD Dissertation Committees (p. 10). This faculty member may or may not be a member of the registration unit. The committee must be assembled within the first semester of the program and must include faculty members from all of the participating units. At least two units must be represented on the committee.

This committee will be responsible for overseeing the completion of the degree requirements. It will also be responsible for the administrative elements of the program, such as the monitoring of satisfactory progress; the design and grading of the preliminary and comprehensive exams, if applicable; graduation clearance; etc. This interdisciplinary committee is also responsible for an annual review of the progress of the student and for reporting this progress to the registration unit on an annual basis.

Information for Entering Students

Graduate education at Northeastern integrates the highest level of scholarship across disciplinary boundaries with significant research and experiential learning opportunities in Boston and around the world. Northeastern offers more than 165 graduate programs, ranging from doctoral and full-time master's programs to part-time programs and graduate certificates, including an array of innovative PhD and master's programs designed to prepare students for emerging new fields. Students are able to take courses on campus, online, or in hybrid formats. This multidimensional learning environment offers students the knowledge and experience to excel and the flexibility to create the educational experience that best meets their needs. Our graduates are well positioned to meet the diverse demands of careers in academia, industry, and the professions.

Living in Boston

Boston is an exciting city that is the perfect place for students. For links to Boston landmarks, cultural institutions, news sources, city guides, and off-campus apartment listings, visit the links below.

Off Campus Student Services

226 Curry Student Center
617.373.8480
offcampus@northeastern.edu

Off Campus Student Services provides a wide range of information, resources, and educational workshops for students who are interested in living off campus or who already live off campus.

Off Campus Student Services provides assistance in searching for off-campus housing, finding roommates, and learning more about the communities surrounding Northeastern University. Our website offers a host of resources including an apartment search database, information on transportation, and City of Boston tenant services, as well as contact information for area real estate professionals.

Off Campus Student Services publishes a monthly e-newsletter that provides valuable tips and information on upcoming programs and events both on campus and off campus. Individuals interested in receiving our newsletter can email us at offcampus@northeastern.edu or stop into the office Monday through Friday.

For more information, visit the Off Campus Student Services website (http://www.northeastern.edu/offcampus).

Information for International Students

Office of Global Services

Website (http://www.northeastern.edu/ogs)
405 Ell Hall
617.373.2310
617.373.8788 (fax)

The Office of Global Services (OGS) offers a vast array of programs and services to more than 11,000 international students and scholars who represent approximately 130 nations.

The OGS also works to promote meaningful interaction and intercultural understanding among citizens of other countries and their peers from the United States, providing educational and cultural enrichment opportunities for all members of Northeastern and the community at large.

The OGS oversees the Student and Exchange Visitor Information System (SEVIS) at Northeastern, as mandated by the U.S. federal government, in order to ensure compliance with regulations and procedures affecting those international students and scholars in specified nonimmigrant visa classifications.

Affiliation with the OGS begins with admission to the academic program and continues through such initiatives as the OGS's cultural festival in February, "OGS Carnevale," which celebrates the cultural diversity of the entire university community. For a list of OGS services and programs, visit the website.

International students must maintain full-time status at Northeastern to be in compliance with immigration and SEVIS regulations. Also, they must not engage in any type of employment unless authorized by the OGS. Note that timely registration for courses is especially important so that they may remain in compliance with current federal regulations. They should consult with the OGS if they have questions about their individual status.

Coming to Boston

Preparing to travel to Boston and begin your studies at Northeastern University is exciting, and you have many things to do in preparation for both. When you plan carefully, your travels and arrival in Boston should go smoothly. Here are some of the key things you should do to prepare.

- **Obtain your F-1 or J-1 visa** from the U.S. embassy or consulate in your home country to be eligible to study in the United States. An international student may attend Northeastern in a nonimmigrant status other than F-1 or J-1 only if U.S. immigration regulations allow for study in the United States under that specific nonimmigrant visa classification. Some international students must apply and be approved for a change of status (e.g., from B-2 to F-1) before beginning the program at Northeastern. For detailed information/instructions specific to your current nonimmigrant status, as well as eligibility to participate in co-op or other forms of experiential learning required by your academic program, contact the OGS (http://www.northeastern.edu/ogs/visaprocess.html).
- **Mandatory Student Health Insurance:** Since September 1989, Massachusetts law (M.G.L. c.15A, § 18) has required every full-time and part-time student enrolled in a certificate, diploma, or degree-granting program in a Massachusetts institution of higher learning to participate in a Student Health Insurance Program (SHIP) or in a health benefit plan with comparable coverage. The Student Health Program defines a part-time student as a student enrolled in at least 75 percent of the full-time curriculum. (College of Professional Studies graduate students—7 credits, part-time graduate students—6 credits).

- **Health report:** Prior to entering Northeastern, all enrolled students must complete and submit a health report to University Health and Counseling Services (UHCS). It must be completed and returned by the stated deadline. The required record of immunity section is necessary for compliance with the Massachusetts immunization requirements for college-age students. Failure to meet the requirement will prevent future course registration. Additionally, further documentation of immunity is mandatory for students in Bouvé College of Health Sciences. Visit the UHCS webpage (http://www.northeastern.edu/uhcs) to access the health report online.

Planning Information

As a new international student you are expected to arrive by the start date of your program stated on the I-20 issued by Northeastern or on the DS-2019 issued by Northeastern or by your sponsoring agency/government.

When you make your travel arrangements, you should seek admission to the United States no more than 30 days prior to the report date on your I-20 or DS-2019, and you should not arrive after the report date on your I-20 or DS-2019.

All international students will need to attend the scheduled international student orientation program and complete the international student online check-in process. For further details on the OGS international student orientation and online check-in process, and for other information pertinent to international students, check the OGS website (http://www.northeastern.edu/ogs).

International Student Orientation

At the beginning of each semester the OGS organizes sessions, events, and activities designed to ensure you have completed all U.S. documentation requirements and to provide you with information and support to ease your transition to life in the United States and at Northeastern University. During these sessions, you will also have the opportunity to meet other international students, learn from shared experiences, and find any assistance you may need.

Orientation week is very important. Make sure you are following all the instructions provided by your academic department and the OGS about the program, and attend as many scheduled events as you can to ensure a smooth transition during your first few weeks on campus.

For a schedule of required sessions and other events, see the OGS website (http://www.northeastern.edu/ogs/schedule.html).

If you are a U.S. citizen living abroad, you are not required to complete OGS's activities and sessions. You are more than welcome, however, to attend other sessions and events planned by the OGS during orientation. Visit the orientation schedule on the OGS website (http://www.northeastern.edu/ogs/schedule.html) to see a full listing of other sessions and events.

Participate in Cultural Events

We are proud to offer cultural events throughout the academic year to the Northeastern community. For more information and to register, check the schedule of events on the OGS website (http://www.northeastern.edu/ogs/schedule.html).

SEVIS Compliance

The OGS is required to comply with immigration regulations governing your student status and must submit information every semester as required by the Department of Homeland Security.

The OGS: Your Resource for SEVIS Advice and Assistance

The OGS advises students on the complexities of immigration compliance and interfaces with various U.S. government agencies. The OGS maintains and updates the SEVIS system and advises students on relevant issues related to nonimmigrant student status by individual appointments or through workshops and information sessions. Consult the OGS whenever you have a question relating to your nonimmigrant student status or any aspect of SEVIS compliance.

Academic Resources

Libraries

Website (http://www.library.northeastern.edu)
Northeastern University Libraries
617.373.8778

Snell Library is the university's primary research library, with collections and services supporting research and teaching across disciplines. Holdings are extensive, with a large proportion available digitally. Collections include more than 800,000 print volumes, more than 500,000 e-books, 70,000 serial subscriptions, 74,000 licensed e-journals, and more than 6,300 feet of archival and manuscript collections. Additionally, Northeastern University Libraries is a selective federal depository, maintaining a collection of materials (mostly online) published and distributed by the federal government.

Snell Library is also the primary study environment on campus, open 24/7 to the whole university community, year-round. Spaces include group, quiet, and silent work areas, with more than 30 group study rooms with whiteboards and plug-in displays for collaborative group work. Individual study rooms are also available for graduate students. In partnership with Information Technology Services, the library supports the Digital Media Commons and InfoCommons computing areas, providing high-level media creation and editing capabilities. The Digital Media Commons also includes a 3D printing studio with a full suite of fabrication technologies and professional-level audio and video recording studios.

Services provided by Snell Library include both on-site and distance reference, the latter including 24/7 live chat with a reference librarian; subject-specialist librarians who provide in-depth consultation and research support for each academic program at the university; and an interlibrary loan system for providing materials not readily available at Northeastern. Digital scholarship project support and tools are also available through an institutional repository and data management services. The library also teaches workshops on digital media tools and resources and instructional sessions about library research for students and faculty.

A free, university-operated shuttle service provides students with a safe ride home (within a mile radius of campus) from Snell Library every 20 minutes from 7:00 p.m. to 6:00 a.m.

The School of Law Library, located on five floors in the Knowles Law Center, includes a comprehensive collection of U.S. legal materials in print and in electronic format. Of particular note is the library's collection in the areas of public interest law; international human rights law; and public health, death penalty issues, and progressive lawyering. Access to print and electronic materials is provided through Scholar OneSearch,

the university's online library catalog. More information can be found at the School of Law Library webpage (http://www.northeastern.edu/law/library).

Office of the Registrar

Walk-in address
271 Huntington Avenue

Mailing address
Northeastern University
ATTN: Office of the Registrar, 230-271
360 Huntington Avenue
Boston, MA 02115-5000

617.373.2300
617.373.5351 (fax)
registrar@northeastern.edu
Website (http://www.northeastern.edu/registrar)

The Office of the University Registrar provides an important link between the university's academic programs and policies and the student. It administers a number of specific services, including class scheduling, registration, record functions, verification of enrollment, reporting, transcript services, and Commencement.

The registrar's office utilizes the myNEU web portal (http://myneu.neu.edu/cp/home/displaylogin) to provide students convenient access to information and services, including class schedules and registration, most recent grades, unofficial transcripts, and transcript and enrollment verification requests. Additional information is available at the registrar's office website (http://www.northeastern.edu/registrar).

Information Technology Services

617.373.4357 (xHELP)
help@northeastern.edu
ITS Website (http://www.northeastern.edu/its)

Information Technology Services (ITS) is the centralized technology resource for students, faculty, and staff. ITS provides secure, high-speed internet access through the on-campus networks NUnet and ResNet; wireless internet connectivity through NUwave; centralized computer labs—the InfoCommons and the Digital Media Commons (DMC)—with the latest software; on-site and remote printing; access to the Blackboard learning management system; a vast array of software applications for Windows and Mac; access to myNEU, Northeastern's online portal; on-site and online training on popular software; and high-performance research computing.

ITS Service Desk

ITS Service Desk, Snell Library
617.373.4357 xHELP
help@northeastern.edu

The ITS Service Desk provides phone-based technology support services to students, faculty, and staff. The staff also offers support for ITS-managed printers and answers general computing questions. Contact the ITS Service Desk for the following services:

- Troubleshooting Northeastern University–provided accounts and applications, including email
- Investigating wired and wireless network connection problems
- Troubleshooting network printer problems
- Assisting with myNEU and Blackboard questions

ITS Help and Information Desk, Snell Library
617.373.4357 xHELP
help@northeastern.edu

The ITS Help and Information Desk is located on the first floor of Snell Library near the InfoCommons. Visit the ITS Help and Information Desk for the following services:

- Assistance on computer-related issues to students, faculty, and staff with a valid Northeastern ID
- Support for ITS-managed computer labs
- Access to equipment available for loan including AV equipment and laptop computers and adapters.

myNEU

myNEU Website (http://myneu.neu.edu)

Your myNEU username and password provide access to key university platforms, from the myNEU portal to other university systems, including wireless network access, printing, and email.

myNEU—the online portal for the Northeastern community—is a central resource for students, faculty, and staff. The myNEU portal offers services tailored to your role at Northeastern for all academic, personal, and recreational needs. Resources available for students include links to student email, information channels, financial aid, Blackboard, and online course registration. NU Alert, our real-time university emergency notification system, utilizes the contact information provided within myNEU. It is your responsibility to maintain accurate personal and emergency contact information.

ResNet and the ResNet Resource Center

Speare Commons
617.373.HELP (x4357)
resnet@northeastern.edu
ResNet Website (http://www.northeastern.edu/resnet)

ResNet—a service of ITS and Housing Services—provides internet access to all students living in Northeastern residence halls. The ResNet Resource Center, located in Speare Commons, provides students with support for the HuskyCable HD*plus* service, mobile devices, gaming systems and other devices, student email, computer troubleshooting, and repair services for Apple and Dell computers.

Printing

The Northeastern Printing Program provides a limited amount of free printing each year to students, faculty, and staff. Each September, as an active member of the community, you are given a credit of $120 on your Husky Card to use at your discretion at any of the ITS-managed printers located across the main Boston campus as well as the Boston Financial District campus, Charlotte campus, and Seattle campus. Print credits do not carry over from one academic year to the next.

Print jobs can be directly sent to the appropriate printer queue from any ITS computer labs or from your own computer by using the Virtual Print Client software available from Software Downloads on myNEU (https://myneu.neu.edu) to print remotely. When you locate a printer associated with the appropriate printing queue, simply swipe your HuskyCard, select your print job, and it will print. For more information visit the ITS website (https://www.northeastern.edu/its/services/printing-plan).

Appropriate Use Policy

The information systems of Northeastern University are intended for the use of authorized members of the community in the conduct of their academic and administrative work. The Appropriate Use Policy (AUP) describes the terms and conditions of Northeastern information systems use. For more information, visit the Appropriate Use Policy webpage (http://www.northeastern.edu/aup).

Training Services

ITS training provides the following instructor-led and web-based courses free of charge to all members of the Northeastern community:

- **Instructor-led training:** this includes classes such as Tools for Creating Online Content and Interactions, Introduction to Online Photo Editors, Blackboard, and other software that ITS and Academic Technology Services (ATS) support. Instructor-led training generally occurs in a library computer lab to enable a hands-on approach to learning software with a facilitator who can respond to participant interests.
- **Web-based training:** ITS training offers computer training over the internet, including Mac tutorials, MS Office tutorials, some application-specific training provided by the application vendors, and via Lynda.com, which offers 24/7 access to an extraordinary breadth of training modules. Web-based training is an innovative, self-paced learning method that allows students, faculty, and staff to train anytime or anywhere, using a computer with an internet connection or any mobile device.

  To browse the list of courses or to register for a class, visit the training section of the ITS (https://www.northeastern.edu/its) or the Learn@ATS section of the ATS (http://www.ats.neu.edu/learnats) website.

Academic Technology Services (ATS)

212 Snell Library
ats@northeastern.edu
ATS Website (http://www.ats.neu.edu)

For graduate students performing teaching assistant/graduate assistant work, Academic Technology Services (ATS) is a resource for choosing and implementing technological solutions for a wide range of classroom goals. Whether creating online classes or incorporating flipped classroom techniques into on-ground classes, ATS offers consultation and support for implementation. Additionally, ATS manages the Discovery Lab, located on the first floor of Snell Library, which is a space for showcasing ideas and innovations at Northeastern. The Discovery Lab is an area to host both events and exhibitions.

Campus Resources

Career Development

Website (https://www.northeastern.edu/careers)

103 Stearns Center
617.373.2430
617.373.4231 (fax)
careerservices@northeastern.edu

Career Development provides resources, guidance, and opportunities that help students and alumni with the following:

- Choose a major and explore career options that fit their unique attributes
- Make career decisions that will engage them in productive and fulfilling work
- Prepare for and conduct successful job searches
- Create meaningful and effective engagement with employers
- Contribute to meeting global and societal needs

Northeastern's Career Development does not guarantee employment nor do student referrals to prospective employers regarding job openings.

Campus Recreation

Marino Recreation Center
617.373.4433
Website (http://www.campusrec.neu.edu)

Exercise your body, mind, and spirit. The campus recreation program provides many outlets to help clear your mind and recharge your spirit. Our fitness facilities, unique among Boston-area colleges and universities, are open year-round. All programs were designed with you in mind; so whether you enjoy group fitness classes, ice hockey or street hockey, basketball, weight training, or swimming, campus recreation has something for everyone.

Full-time Northeastern students in good standing who are enrolled in classes and/or co-op, or scheduled for vacation but have paid the campus recreation fee, have access to the Marino Recreation Center, Cabot Center, and the Badger and Rosen SquashBusters Center. Part-time students in good standing have access during any academic quarter in which they are enrolled and attending classes, as long as they have requested and paid the campus recreation fee. Help us maintain a safe and secure environment. Your Northeastern photo ID card—which must be a current, valid, and active card—must be swiped upon arrival in order to enter all facilities.

Center for Advancing Teaching and Learning Through Research

215 Snell Library
617.373.3157
617.373.7779 (fax)
learningresearch@northeastern.edu
Website (http://www.northeastern.edu/learningresearch)

The Center for Advancing Teaching and Learning Through Research (CATLR) provides professional development for all graduate students

at Northeastern in their roles as teaching assistants, instructors, and future faculty and professionals. We provide a range of opportunities for graduate students to develop effective teaching skills, including course design and communication. CATLR is committed to supporting your success at Northeastern and beyond, and we welcome you to:

- Participate in workshops and other events to learn about effective practices in teaching and course design and to adapt them for your own current or future use.
- Meet one-on-one with a CATLR consultant to discuss any aspect of teaching or preparing for the academic job market and postdoctoral careers, including developing course syllabi, teaching statements, teaching portfolios, and diversity statements.
- Invite a CATLR consultant to observe your class, recitation, lab, studio, or guest lecture and to meet with you afterward to share and discuss their observations in relation to your own goals and reflections.
- Apply to the Future Faculty Program for Teaching in Higher Education to prepare for the various dimensions of a faculty career.

All of CATLR's services are provided on a formative and confidential basis.

Disability Resource Center

20 Dodge Hall
617.373.2675
617.373.7800 (fax)
www.northeastern.edu/drc

Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act as Amended (ADAAA) to participate fully in the activities of the university. According to the ADAAA definitions, a person with a disability is one with a physical, mental, emotional, or chronic health impairment that *substantially limits* one or more major life activity such as caring for oneself, performing manual tasks, seeing, hearing, eating, sleeping, walking, standing, lifting, bending, speaking, reading, breathing, learning, working, concentrating, thinking, communicating, and nonvolitional bodily functions.

Students should provide documentation to the DRC at their earliest convenience to allow for sufficient time for review. After the documentation has been reviewed, a disability specialist will contact the student regarding appropriate next steps.

Graduate Student Government

Website (http://www.northeastern.edu/gsg)
236 Curry Student Center
617.373.4502
GSG@northeastern.edu

The Graduate Student Government (GSG) represents graduate students at Northeastern University, serving as a liaison among the administration, faculty, staff, and students. The role of the GSG is to address the professional, financial, social, and representative needs of the graduate community as follows:

- Seeks to improve the quality of graduate student life, academic affairs, and research
- Offers access to professional development resources and networking
- Facilitates cooperation among the graduate student groups and organizations
- Distributes the graduate activity fee
- Sponsors graduate orientation programs
- Fosters interdepartmental and intercultural communication and appoints graduate representatives to serve on university committees

All graduate students are eligible to be part of the GSG Senate. Representatives from the eight graduate and professional schools assist the executive board in the affairs of this governing organization. The senate meets regularly during the fall and spring semesters, and all meetings are open to all students.

Husky Card Services

4 Speare Commons
617.373.8740
HuskyCard@northeastern.edu

Husky Card Services prints Husky Cards, the official identification card of Northeastern University. The Husky Card is used for many purposes, including access to locations, parking, laundry, printing, vending machines, dining services, off- and on-campus vendors, and library book checkout.

Students who are registered for courses on the Boston campus of Northeastern University can come to the Husky Card Services office to obtain their card. A government-issued photo ID must be presented when receiving your Husky Card.

Students who have registered for courses at the Charlotte and Seattle campuses may contact their campus to obtain a Husky Card.

Students who are registered in online courses only are eligible to have their Husky Cards mailed to them. If you are an online student and would like a Husky Card mailed to you, send an email to HuskyCard@northeastern.edu (HuskyCard@neu.edu) with your name, Northeastern University ID number, address, and college/degree. Once we have this information, we will open the photo upload option through your myNEU account, which will allow you to upload a photo. Once your photo is submitted, it will take up to **two weeks** for the photo to be approved and the Husky Card to be mailed to you. Allow more time for international mail.

John A. and Marcia E. Curry Student Center

Website (http://www.northeastern.edu/curry)
434 Curry Student Center
617.373.2642

This campus “living room” serves as a hub of student activity. It is the crossroads of community life at Northeastern, offering cultural, social, and recreational programs and services.

The center offers ATM machines, an art gallery, the afterHOURS late-night club, food court and cafeteria, game room, lounge space, meeting rooms, Starbucks Coffee, student organization offices, a TV viewing area, and WRBB-FM.

Student center facilities may be reserved by recognized student organizations and university departments. The university reserves the right to limit the use of its facilities when the general public is involved.

Northeastern University Bookstore

Main Campus
Curry Student Center, ground floor
617.373.2286
Website (http://www.northeastern.bncollege.com)

The bookstore operates during the entire academic year, but days and hours may vary in accordance with the university's calendar.

Purchases can be made by cash, check, American Express, MasterCard, VISA, Discover, or Husky Card.

Parking

Student Financial Services
354 Richards Hall
617.373.7010
Commuting Services (http://www.northeastern.edu/commutingservices)

Parking spaces in the university lots and garages are filled on a first-come, first-served basis. To park in a university lot or garage, students must have a valid parking permit displayed on their vehicles. A parking permit does not guarantee a parking space.

New students may purchase a day-parking permit. Only eligible students will receive a permit. To be eligible, students must be registered for a class or on co-op. The cost of the permit will be charged to the student's tuition account.

Overnight parking permits are limited.

To apply for a parking permit, visit the self-service tab on myNEU and select "Apply for Parking."

To park in a handicap space, individuals must purchase a parking decal and display a state-issued handicap license plate, placard, or hangtag. Handicap parking spaces are located throughout campus. Please use the campus map (http://www.northeastern.edu/commutingservices/wp-content/uploads/2015/08/CampusMap2015_11x17.pdf) as a guide for handicap-accessible parking spaces on campus.

Operators of vehicles driven or parked on university property are responsible for knowing and complying with university driving and parking regulations.

Refer to the parking website (http://www.northeastern.edu/commutingservices) for more information.

Public Safety

Public Safety Division Administrative Offices
100 Columbus Place
617.373.2696
Website (http://www.northeastern.edu/publicsafety)

Police Operations Center
100 Columbus Place
617.373.3333 (EMERGENCY—police, fire, or medical)
617.373.2121 (nonemergency regular business)
617.373.3934 (TTY emergency or nonemergency)

Personal Safety Escort Service
617.373.2121

The Public Safety Division's mission is to provide a comprehensive program of police, security, fire safety, and emergency medical services to help ensure the campus remains a safe and pleasant place to live, work, and learn.

The University Police Department is the largest and most visible unit of the division and consists of professionally trained officers charged with the protection of life and property and the prevention and detection of crime on campus. University police officers have the same authority as municipal police officers and enforce both the Massachusetts laws and university regulations. Regulations mandate that students show their university ID cards whenever requested to do so by any university police officer. For more information, visit the public safety website (http://www.northeastern.edu/publicsafety).

The Public Safety Division takes pride in its comprehensive plan to minimize crime and protect the safety of the Northeastern community. But the division needs students' help and urges students to take responsibility for creating and maintaining a safe and secure environment. For tips on safety around campus and in the neighborhood, pick up a brochure or visit the website.

Fire egress drills are held each semester in all residence halls to familiarize residents and staff with the alarm system and the evacuation routes. Special fire safety and evacuation training is provided for students, faculty, researchers, and staff in high-risk laboratories. All building occupants are required to participate when an egress drill is held. For tips on fire safety, pick up a brochure or visit the website.

The Personal Safety Escort Service provides a door-to-door escort from one on-campus location to another whenever personal safety is a concern. After receiving your call, the university police dispatcher will assign an officer or cooperative education cadet within 10 to 15 minutes (if necessary, the dispatcher will advise you of any expected delays).

A special, nighttime off-campus escort service runs from dusk to dawn to transport students who reside within approximately one mile of the campus from the campus to their residence after dark. The only destination this service will take you to is your residence. A van stops at Snell Library and the Ruggles Public Safety Substation on the hour from 7:00 p.m. to 6:00 a.m. to pick up students.

If you are sexually assaulted, either by a stranger or an acquaintance, get to a safe place, then telephone the university police and a friend or family member. A university police officer who is a state-certified sexual assault investigator will meet with you and address your physical and emotional needs, as well as inform you of your rights and options regarding filing charges against the perpetrator. The police will provide you with important information about on-campus as well as off-campus counseling services as well as other options regarding changing your residence or class schedule.

If the sexual assault took place off campus, the University Police Department can still provide emergency medical treatment, transportation to a medical facility, and counseling referrals. However, the criminal investigation of such cases is the responsibility of the police department that has jurisdiction in the locale where the assault took place, and university police will assist you with making contact with the appropriate agency.

University Health and Counseling Services

Website (http://www.northeastern.edu/uhcs)
Forsyth Building, Suite 135
617.373.2772

UHCS@northeastern.edu

The University Health and Counseling Services team is eager to serve you. We hope that you will use our center as a resource to help stay healthy, physically and mentally, and for care when you are ill or injured, depressed, or stressed.

We Care

Website (http://www.northeastern.edu/wecare)
104 Ell Hall
617.373.4384
we_care@northeastern.edu

We Care is a program that assists students experiencing unexpected challenges maintaining their academic progress. We Care works with the student to coordinate among university offices and to offer appropriate on- and off-campus referrals to support successfully resolving issues.

College Expenses

Tuition and Fees

Tuition

Graduate Program	Cost per Credit Hour
Applied Behavioral Analysis	$1,095
Arts, Media and Design	$1,433
Audiology (AuD) (per term)	$12,400
Audiology (AuD) clinical (per term)	$9,215
Biotechnology, Bioinformatics, Applied Math	$1,445
Bouvé College of Health Sciences	$1,445
Business Administration, including online graduate programs	$1,560
College of Professional Studies—Doctorate in Education	$797
College of Professional Studies—Graduate on campus and online (excluding MEd and MAT)	$671
College of Professional Studies—MEd and MAT programs	$552
Computer and Information Science	$1,540
Direct Entry PharmD (per term)	$24,280
Direct Entry PharmD Clinical	$14,875
Engineering	$1,523
Health Informatics	$1,212
Information Assurance	$1,450
Marine Biology	$1,260
MS in Accounting	$1,565
MS in Innovations	$1,665
MS/MBA (full program)	$66,528
Nurse Anesthetist clinical (in addition to tuition)	$3,610
Nursing, direct entry (per term)	$17,290
Physical Therapy—postbaccalaureate direct entry (DPT) (per semester)	$16,780
Physical Therapy—postbaccalaureate direct entry (DPT) clinical (per semester)	$11,440
Physician Assistant (per term)	$14,380
RN to BSN online	$796
Science	$1,445
Social Sciences and Humanities	$1,295
Dissertation (flat rate)	Equivalent to 1.5 times the college per-credit-hour rate listed above
Master's or doctoral continuation fee (flat rate)	Equivalent to the college per-credit-hour rate listed above

Fees

Item	Fee
Student center fee (per term, Boston campus only)	$70 full-time
	$10 part-time
College of Professional Studies student center fee (per quarter, Boston campus only)	$8.25
Student recreation fee (per term)	$56 full-time
	$25 part-time
College of Professional Studies student recreation fee (per quarter, Boston campus only)	$10
Student activities fee (per year, Boston campus only)	$14
Health and counseling fee	$225
Health plan fee (yearly, optional)	Visit the NUSHP website: www.northeastern.edu/nushp (http://www.northeastern.edu/nushp)
Parking (optional, per semester)	Visit the parking website: www.northeastern.edu/commutingservices (http://www.northeastern.edu/commutingservices)/
International student fee	$250

Student Refunds

Refund Policies

Inquiries about credit balances should be directed to Student Accounts. Refund requests for credit balances are made via the "Self-Service" tab on the student's myNEU web portal (http://myneu.neu.edu). Credit balances will be refunded to the student, unless otherwise directed by the student or the bill payer.

Note the following exception: If the credit in your account is due to a Parent Plus/Alternative Loan and/or payment plan payment(s), the borrower or bill payer must complete the Refund Authorization form (https://studentfinance.northeastern.edu/forms) prior to releasing the funds requested.

Official Withdrawal Adjustments

Students who officially withdraw, either from a course or from the university, during an academic term will receive a tuition refund based on the policy specified below. Institutional funds awarded by Northeastern University will be adjusted based on the actual charges incurred during the semester. Funds from federal Title IV programs will be returned to the government according to federal regulations. The federal government Return of Funds Policy dictates that a student's eligibility for federal financial aid is determined by the number of days enrolled during the

semester. The refund will be calculated from the day the student submits a notification of withdrawal to the Office of the University Registrar.

Tuition credits are granted through the first five weeks of a semester or first four weeks of a half-semester, based on the date of the official withdrawal processed by the Office of the University Registrar. Nonattendance does not constitute official withdrawal. Credit policies vary according to the duration of the course. Typical tuition adjustments are made according to the following schedule. (The end of week three corresponds with the last day to drop a class without a W grade.)

DURING FULL SEMESTER

During weeks one through three—100% refund
During the fourth week—60% refund
During the fifth week—40% refund
After the fifth week—no refund

SUMMER HALF SEMESTERS AND COURSES OFFERED IN PART-OF-TERM FORMAT

During weeks one through two—100% refund
During the third week—50% refund
During the fourth week—25% refund
After the fourth week—no refund

Leave of Absence Tuition and Fee Adjustments

Leaves are granted when a student cannot complete the current academic period for health or personal reasons but is confident that he or she will reenroll (additional information about leaves of absence (p. 25)). Northeastern's medical and emergency leave policy states that all ***tuition*** paid for such periods of leave will be held by the university and applied to future charges. Outstanding balances (including unpaid balances) for the academic semester in which the leave is taken are still due to the university during that semester. Financial aid recipients should contact the graduate financial aid office to understand the effects on aid received. Medical leave information is available at the University Health and Counseling Services website (https://www.northeastern.edu/uhcs). Students who take a leave of absence should be aware that more than six months on leave will cause many student loans to go into repayment.

Disability Resource Center Tuition Adjustments

Students who are registered with Northeastern University's Disability Resource Center (DRC) and are approved for reduced course loads may be eligible to petition the center for tuition adjustments directly related to their documented disability. Further information is available from the DRC.

State-Specific Refund Policies

For refund information for Maryland, Oregon, and Wisconsin residents, visit the Student Financial Services website (https://studentfinance.northeastern.edu/policies-procedures).

Financial Aid Assistance

Student Financial Services

354 Richards Hall
617.373.5899
617.373. 2897 (College of Professional Studies)
sfs@northeastern.edu
studentfinance.northeastern.edu (https://studentfinance.northeastern.edu)

Northeastern University is available to assist students in developing a plan for financing a Northeastern education. Through a variety of options—including federal financial aid, Northeastern's monthly payment plan, supplemental loans, and your own resources—a plan can be designed that will make your education costs affordable. Visit the Student Financial Services website (https://studentfinance.northeastern.edu) or call 617.373.5899 for additional information.

Federal Financial Aid

Student Financial Services is committed to working with you to identify federal financial aid options that can help make a Northeastern education affordable. To apply for federal financial aid programs, students must submit the Free Application for Federal Student Aid (FAFSA) form. Meeting priority filing dates will allow the review of your eligibility for all available financial aid programs. The priority deadline for graduate students is March 1. For information regarding your financial aid application, log into your myNEU (http://www.myneu.neu.edu/cp/home/displaylogin), click on the "Self-Service" tab, and select "My Financial Aid Status."

Students in the graduate colleges must meet the following criteria to be eligible for federal financial aid:

- Be enrolled in at least 6 credits per term for federal financial aid, unless you are on a co-op, clinical rotation, or residency or are enrolled in a full-time or part-time stand-alone course listed on the Office of the University Registrar's website (http://www.northeastern.edu/registrar/full-time-half-time.html)
- Be citizens or eligible noncitizens of the United States
- Be matriculated in a degree-granting program
- Have received a high school diploma or GED
- Be registered with Selective Service (if required)
- Not be convicted of a drug-related crime in the last year
- Not be in default from previous student loans
- Maintain satisfactory academic progress

How to Apply

File the FAFSA by March 1 in order to be considered for all available federal aid. Northeastern's FAFSA school code is 002199.

To electronically sign your FAFSA, you will need your Federal Student Aid ID (FSA ID). If you do not have one or have forgotten your FSA ID, visit the Federal Student Aid (https://studentaid.ed.gov/sa/fafsa/filling-out/#get-fsaid) webpage to obtain one before starting the FAFSA online.

Awarding Timelines

New students are awarded on an ongoing basis throughout the spring after we have been notified that they have been accepted into their program.

Returning students are awarded throughout the summer.

Typical Graduate Financial Aid Award

Students who file the FAFSA will be eligible to receive up to $20,500 in a Federal Direct Unsubsidized Loan, assuming that all eligibility requirements have been met.

For more information about the Federal Direct Loan Program, visit the Student Financial Services website (https://studentfinance.northeastern.edu/applying-for-aid/graduate/types-of-aid).

Graduate Assistantships and Scholarships

These positions and awards are offered directly by the individual graduate schools or academic departments. Students seeking such assistance should contact their graduate school for eligibility criteria.

To review a description of available graduate assistantships and scholarships, visit the Student Financial Services website (https://studentfinance.northeastern.edu/applying-for-aid/graduate/types-of-aid).

Health Professions Student Loans and Nursing Student Loans

These federal loan programs carry a 5 percent interest rate during repayment. You must demonstrate financial need and meet Northeastern's priority filing date for consideration, as funds are limited. Northeastern serves as the lender, and the loan is made with government funds. Repayment is made to Northeastern. For nursing loans, there is a 9-month grace period prior to repayment following graduation, withdrawal, or a drop below half-time status. The grace period is 12 months for Health Professions Student Loans. Repayment on the loan is for a period of up to 10 years with a minimum 40 dollar monthly payment. The loan may be prepaid at any time without penalty.

To be eligible for the Health Professions Loan Program, applicants must be enrolled full-time in the School of Pharmacy in the Bouvé College of Health Sciences. To be eligible for the Federal Nursing Student Loan, applicants must be enrolled at least half-time in the School of Nursing in the Bouvé College of Health Sciences.

Physician Assistant Loan

The Physician Assistant Loan is awarded to full-time students in the graduate physician assistant program who demonstrate financial need after filing the FAFSA. The interest rate is fixed at 7 percent. Northeastern University is the lender, and repayment is made directly to Northeastern. The loan amounts range from $1,000 to $3,000, depending upon the student's financial need. Repayment begins one month after the student ceases to be enrolled full-time at Northeastern University.

Federal Direct Graduate PLUS Loan

Unlike Federal Direct Stafford Loans, the Federal Direct Graduate PLUS Loan requires credit approval by the direct loan servicer. Application requests are submitted to Student Financial Services. Students have up to 25 years to repay the Federal Direct Graduate PLUS Loan. The Federal Direct Graduate PLUS Loan can be consolidated with Federal Direct Stafford and Perkins loans upon graduation.

Graduate PLUS loans do not have a grace period. Repayment begins after a student is no longer enrolled at least half-time. Students who drop below half-time status and then reenroll above half-time status will need to request their loans be deferred again through their assigned direct loan servicer.

Graduate students with myNEU access can apply for a Federal Direct Graduate PLUS Loan through the student portal by clicking on the "Federal Graduate PLUS Loan Application" link under the "Self-Service" tab. Students who do not have portal access or have trouble applying via the portal should download, print, and complete the paper application that can be found at Student Financial Services (https://studentfinance.northeastern.edu/billing-payments/financing-options).

Supplemental Student Loans

There are a number of educational loan programs available to assist students in covering their expenses over and above any federal financial aid that may be awarded to them from Student Financial Services. Most private lenders have credit and income requirements that must be met before being approved for these programs. Additional information regarding private loans is available at Student Financial Services (https://studentfinance.northeastern.edu/billing-payments/financing-options). Student Financial Services recommends to students that, when researching the loan and lender that best meets their needs, they make sure they take into consideration the interest rate, origination, disbursement, or repayment fees and the quality of customer service.

General Financial Policies and Procedures

FINANCIAL AID POLICIES

Student Financial Services reserves the right to adjust a student's initial Offer of Financial Assistance based upon information brought to the office's attention subsequent to extension of the offer, including, but not limited to, increased or new institutional scholarships, outside scholarships, or revised family financial data.

APPEAL/CHANGE IN CIRCUMSTANCES

If the student feels that the aid process does not accurately reflect his or her situation, or if family circumstances change during the year, the student should notify his or her graduate student financial services counselor for further evaluation. We may request additional documentation from you that might indicate a change in financial circumstances.

CHANGE IN ENROLLMENT STATUS

Students must notify Student Financial Services about any change in planned period of enrollment, whether due to withdrawal from a class, a leave of absence, a change in co-op or academic division, or withdrawal from the university. Students should be aware that any change in enrollment status may result in a change in federal or institutional aid eligibility. It is the student's responsibility to notify Student Financial Services about any change in enrollment status and to ensure understanding of the ramifications of such changes. It is highly recommended that whenever possible, students discuss the impact of such changes with their financial aid counselor before making them.

OUTSIDE SOURCES OF AID

Students must notify Student Financial Services of any aid received from outside sources, such as scholarships. Receipt of these sources may require an adjustment to a student's financial aid award.

REAPPLICATION PROCESS

Students must reapply for financial aid each year by filing the FAFSA (https://fafsa.ed.gov) online. To receive priority consideration for aid, the federal processor must receive the FAFSA by March 1.

SATISFACTORY ACADEMIC PROGRESS

To continue receiving financial aid, graduate students must maintain the academic requirements for satisfactory progress set forth by their college. Refer to the Student Financial Services website (https://studentfinance.northeastern.edu/policies-procedures/satisfactory-academic-progress) for more information about how satisfactory progress impacts financial aid eligibility.

VERIFICATION

If a student is selected for verification, Student Financial Services may be required to collect additional documents, including tax returns and other financial documents, to verify the information provided on the FAFSA. Aid cannot be disbursed until this process is completed.

RETURN OF TITLE IV FUNDS

Northeastern University is required by federal statute to recalculate federal financial aid eligibility for students who withdraw, drop out, are dismissed, or take a leave of absence prior to completing 60 percent of a term. Recalculation is based on the percentage of earned aid using the Federal Return of Title IV funds formula. Federal regulations require students to obtain at least one A, B, C, D, or S in at least one course for the term; students who receive all unsuccessful grades for a term (F, NE, W, I, U) may be considered unofficially withdrawn from the term and

subject to an aid recalculation, including the possible loss of financial aid for that term.

Bill Payment

Student Financial Services

354 Richards Hall
617.373.2270
617.373.8222 (fax)
studentaccounts@northeastern.edu

Full payment of tuition and other related charges is due prior to the start of the term as specified on the original bill. For questions related to the billing process, late fees, payment methods, tuition payment plan, and refunds, contact us at the phone number and email address provided above.

Payment of Tuition

Full payment of tuition, residence hall fees, and other related charges is due before the start of each semester. Payments will be accepted for billable charges only. The university is not able to process payments for more than the balance due on the student's account. Accepted methods of payment are:

- Electronic check (E-check). Payments can be made online via NUPay on myNEU (http://myneu.neu.edu) and are processed the same day they are received by the university.
- Through the monthly payment plan. Call 800.635.0120 or visit the Tuition Payment Plan website (http://www.tuitionpaymentplan.com/enroll).
- Supplemental loans. Review options at the Student Financial Services website (https://studentfinance.northeastern.edu/billing-payments/financing-options).
- Additional payment options and details can be found at the Student Financial Services website (https://studentfinance.northeastern.edu/billing-payments/payment-methods).
- International payments using Flywire. Northeastern University has partnered with Flywire to streamline the international wire payment process to the university. This service provides students and their families a safe, cost-effective, and convenient method of making payments to Northeastern University in foreign currencies. Review how to initiate payment at the Student Financial Services website (https://studentfinance.northeastern.edu/billing-payments/payment-methods).

Bills must be paid promptly. If a bill has not been received by the first week of the semester, contact Student Accounts. Transcripts and other academic records will not be released until all financial obligations to the university have been met.

Discrepancies in Your Bill

Discrepancies in your bill should be addressed in writing via email to Student Financial Services at studentaccounts@northeastern.edu. Include your name, account number, dollar amount in question, date of invoice, and any other information you believe is relevant.

If there is a billing problem, pay the undisputed part of the bill to avoid responsibility for any late fees.

Late Fees

In cases where students default on financial obligations, the student is liable for the outstanding balance, collection costs, and any legal fees incurred by the university during the collection process.

Tuition Paid Directly by Employers

When a third party pays tuition directly to the university, the student must provide the Office of Student Accounts with a purchase order or a written statement of intent to pay by the third party prior to the first week of classes. If there are stipulations associated with the payment agreement, such as a minimum grade level, then the student must either pay the university directly or enroll in one of the payment options. Documents pertaining to a third-party agreement can be emailed to thirdparty@northeastern.edu or mailed to the address below.

Student Financial Services/Third Party
354 Richards Hall
360 Huntington Avenue
Boston, MA 02115

617.373.8222 (fax)
thirdparty@northeastern.edu

Tuition Reimbursement

Many companies, embassies, and agencies directly reimburse students for their educational expenses upon successful completion of courses. In these situations, the student is responsible for paying the bill at the beginning of the semester or selecting another payment option. Tuition may not be left unpaid pending reimbursement by a third party.

Tuition and Fees and Default Policy

Tuition rates, all fees, rules and regulations, and courses and course content are subject to revision by the president and the Board of Trustees at any time. In cases where the student defaults on his or her tuition, the student shall be liable for the outstanding tuition and all reasonable associated collection costs incurred by the university, including attorneys' fees.

Mandatory Student Health Plan

Since September 1989, Massachusetts law (M.G.L. c.15A, § 18) has required every full-time and part-time student enrolled in a certificate, diploma, or degree-granting program in a Massachusetts institution of higher learning to participate in a Student Health Insurance Program (SHIP) or in a health benefit plan with comparable coverage. Under SHIP a part-time student is defined as one who is enrolled in at least 75 percent of the full-time curriculum. (College of Professional Studies graduate students—7 credits, part-time graduate students—6 credits).

Students who have comparable health plan coverage may waive the Northeastern University Student Health Plan (NUSHP) by completing a waiver on the myNEU web portal (http://myneu.neu.edu) by the designated deadline date each academic year. For deadlines and additional information, visit the NUSHP website. (http://www.northeastern.edu/nushp)

University-Wide Academic Policies and Procedures

Graduate Schools Academic Policies

Note that this information applies to both undergraduate and graduate students. Not all of the policies and procedures apply to both types of students. *Note:* International students must consult with Office of Global Services (OGS) (http://www.northeastern.edu/ogs) advisors concerning any of the following items in order to maintain compliance with Student and Exchange Visitor Information System (SEVIS) regulations and institutional policy. It is best to set up an appointment to discuss individual cases and learn about appropriate procedures to follow.

Attendance Requirements

The university expects students to meet attendance requirements in all courses to qualify for credit. Attendance requirements vary; it is the student's responsibility to ascertain what each instructor requires.

Failure to meet attendance requirements may force a student to drop the course, as recommended by the instructor and the college.

Permission to make up work may be granted by instructors for reasonable cause. Requests must be made immediately upon a student's return to class.

Absence Because of Student Activities

If students must miss classes to participate in athletic contests or other forms of scheduled intercollegiate activity, they are entitled to makeup privileges. Faculty members may require a written statement from the administrator in charge of the activity.

Absence Because of Illness

A student who is absent from school for an extended period of time must inform his or her college by email from an official university email account or by telephone.

Absence Because of Religious Beliefs

The university maintains the following guidelines regarding student absences because of religious beliefs:

Any student who is unable, because of his/her religious beliefs, to attend classes or to participate in any examination, study, or work requirement shall be provided with an opportunity to make up such examination, study, or work requirement that he/she may have missed because of such absence on any particular day; provided, however, that such makeup examination or work shall not create an unreasonable burden upon such school. No fees of any kind shall be charged by the institution for making available to the said student such opportunity. No adverse or prejudicial effects shall result to any student because of availing himself/herself of the provisions of this section. (Massachusetts General Laws, Chapter 151C, Section 2B, 1985)

Absence Because of Jury Duty

Members of the university community are expected to fulfill their obligations to serve on a jury if called upon.

A student selected for jury duty should inform his or her instructors and/or activity advisors. They will provide a reasonable substitute or compensatory opportunities for any required work missed. Absence will not be penalized in any way.

University Leave of Absence Policies

GENERAL POLICY

Students who wish to take a leave of absence are encouraged to apply for the leave by submitting a petition through the myNEU web portal (http://myneu.neu.edu) one month prior to the start of the semester during which they plan to take the leave.

The usual limit for a leave of absence is one academic semester. International students must contact the OGS (http://www.northeastern.edu/ogs) regarding specific leave of absence procedures. A leave of absence (general, medical, or emergency), if approved, will take into account the following conditions:

- Students who do not return at the end of the leave will be withdrawn and must submit a petition for subsequent readmission to the program.
- Students must return to classes, not cooperative education (co-op).
- Students must be currently enrolled in academic courses or co-op. If a student is withdrawn for any reason, a request for a leave of absence cannot be considered until the withdrawal is resolved.
- Students who receive financial aid should meet with a financial aid counselor before going on a leave.
- Students in university housing should refer to Residental Life and Housing for policy information.
- Students' enrollment status cannot include more than one academic year of consecutive nonclass enrollments.
- After the 11th week of the semester, a student may apply for a leave of absence only for medical reasons or due to military deployment.
- Students who take leaves should be aware that more than six months on leave will cause many student loans to go into repayment. Students should see their financial aid counselor for more information on how their loans may be affected by a leave of absence.

RETURNING FROM A GENERAL LEAVE OF ABSENCE

Students returning from an approved leave of absence may be required to submit to their college's student services office a notification of intent to return. It should be submitted no later than one month prior to the start of the semester in which they intend to return. Students are required to preregister for courses upon returning from a leave of absence. International students returning from a leave of absence should contact the OGS (http://www.northeastern.edu/ogs) regarding SEVIS procedures three to four months prior to anticipated return time.

LEAVE OF ABSENCE DUE TO MILITARY DEPLOYMENT

When a student in the Reserves or in the National Guard is called to active duty, the student must notify his or her college dean's office and provide proof of deployment prior to being deployed. The proof may be faxed, mailed, or hand-carried to the college dean's office. It may take the form of general orders cut by the company commander.

When a student is activated during the term, the university will:

- Excuse tuition for that term. Any payment made will be credited to the student's account.
- Place a "W" on the student's transcript for each class enrollment.

If a student is called to active duty near the end of the term, the student and faculty members may determine that incomplete (I) grades are more appropriate. In this case, tuition will not be waived.

When a student returns to the university after completion of a tour of duty, he or she will notify the college dean's office. The college dean's office will assist the student with registration.

MEDICAL OR EMERGENCY LEAVE OF ABSENCE

Medical leave is an option available to those Northeastern students who develop a major medical condition that precludes class attendance, completion of requirements, and/or co-op. Medical leave petitions must be initiated at University Health and Counseling Services (UHCS). Students are not allowed to take courses for credit toward their degree at Northeastern while on medical leave of absence. International students must contact the OGS (http://www.northeastern.edu/ogs) regarding medical leave of absence procedures. Students can petition their college for an exception to take courses elsewhere based on extenuating circumstances.

Students who wish to reenter the university following a medical leave must contact UHCS. Reentry from a medical leave requires receipt of all documentation delivered to UHCS on or around one month prior to the planned reentry to classes. Once all documentation is received by UHCS, it will be reviewed and the student will be notified of the decision. Students must attend classes on the Northeastern campus for the semester they wish to return from medical leave of absence.

More specific information about the medical leave and reentry process, along with the application for leave, can be found at the UHCS webpage (http://www.northeastern.edu/uhcs/access-to-care/medical-leave-of-absence).

Emergency leaves may be granted when a student cannot continue attending class after the start of the term due to life-changing situations beyond the student's control.

The university's medical leave of absence and emergency leave policy states that all ***tuition*** charged for the term in which the leave has been granted will be held by the university and applied toward future tuition charges in the same academic program. Outstanding balances (including unpaid balances) for the academic term in which the leave is taken are still due the university. Tuition adjustments are made depending on the timing of the leave. The adjustments would follow the same schedule as the official withdrawal adjustments. Financial aid recipients must contact their financial aid counselor to understand the effects on aid received.

If the leave extends more than six months, student loans may go into repayment. Students enrolled in the Northeastern University Student Health Plan (NUSHP) will remain enrolled in the plan for the plan year, ending August 31.

Emergency leave petitions are available in college academic student services offices and specify the conditions and procedures under which such leaves may be granted.

MEDICAL WITHDRAWAL

Permanent departure from the university due to the diagnosis of a major medical illness or injury, or psychiatric illness, necessitates a petition for medical withdrawal. The procedure follows that for the medical leave of absence.

University Withdrawal

Students seeking to withdraw from the university for any reason should contact the student services office of their college.

Students may be withdrawn from the university for financial, disciplinary, academic, or health reasons. In the last case, a committee will review the recommendations of the director of health services to determine whether the student should withdraw. The student has an opportunity to present his or her case to the committee. Withdrawals are made only when it is determined that the student is a danger to himself or herself, or to other members of the university community, or when the student has demonstrated behavior detrimental to the educational mission of the university. International students must contact the OGS (http://www.northeastern.edu/ogs) regarding any compliance issues implications deriving from university withdrawal.

University-Sponsored Travel

Northeastern University is committed to the health, safety, and security of its students and all other members of the university community. As a global institution, our university members undertake international travel in pursuit of teaching, research, consulting, service, cocurricular activities, and work intended to advance learning and the interests of the university. As a result, the university supports standards and expectations associated with international travel that are designed to reduce personal and university risk.

To ensure the safety of our students, you are required to comply with the university international travel policy when traveling abroad on university-sponsored travel. Such travel may include teaching, research, co-op, service, field studies, and volunteer and administrative work.

In order to provide assistance and support to you while traveling abroad, the university maintains a travel registry. In advance of any planned international travel, all students are required to enter their travel plans along with other requested information into the travel registry. To access the registry, go to the myNEU web portal (http://myneu.neu.edu), "Services and Links," and register your travel.

Students are responsible for familiarizing themselves with the university international travel policy and are encouraged to visit the international travel website for guidance.

Academic Calendars

The graduate schools' programs are offered on a semester calendar consisting of fifteen weeks. The College of Professional Studies graduate programs are offered on a quarter calendar consisting of twelve weeks.

Quarter Programs

For student records that include quarter hours, the approved semester-hour conversion rate is (quarter hours) x 0.750. For example, a 4-credit quarter course is equivalent to a 3-credit semester course.

Semester Programs

Traditional semester hours apply.

Student Records and Transcripts

Full-Time Status

Note: Full-time status may be defined differently for federal loan purposes.

A graduate student is considered a full-time student if enrolled in a minimum of 8 semester hours of credit for the semester with the following considerations:

- Students who hold stipended graduate assistantships will be considered full-time if enrolled for a minimum of 6 semester hours of credit.
- Students for whom English is a second language, at the discretion of their departments, will be considered full-time if they are enrolled in a minimum of 8 semester hours or three courses, whichever is less.
- Students holding Dean's scholarships, Diversity fellowships, Double Husky awards, or being supported by Graduate Student Scholarships (GSSs) will be considered full-time if they are enrolled in a minimum of 8 semester hours.
- Students enrolled in Dissertation or Continuation are considered full-time.
- International students enrolled in graduate programs at Northeastern University must consult with the Office of Global Services (OGS) (http://www.northeastern.edu/ogs) on all matters regarding the maintenance of full-time status.

Overload Conditions for Graduate Assistants

Graduate assistants are expected to devote full-time effort to their studies and the duties of their award.

They are not permitted to hold any other job during the term of their assistantship; however, they may be offered limited extra work on campus. Graduate assistants who are not on F-1 or J-1 visas can be offered overload work that does not exceed an average of 6 hours a week or 90 hours a semester, for a total of 270 hours a year (or three semesters). As part of this work, graduate assistants may be hired to teach one 3-semester-hour course as an overload during the year (180 hours). The hours worked during the weeks between semesters are included in this total.

The OGS issues and verifies on-campus work authorization to eligible students in nonimmigrant visa classifications. Due to federal regulations, international graduate assistants cannot be offered overload work. All international students must acquire the appropriate work authorization from the OGS, 405 Ell Hall, prior to engaging each and every time in any form of employment.

Grading System

Grades are officially recorded by letters, evaluated as follows.

Letter Grade	Numerical Equivalent	Explanation
A	4.000	Outstanding achievement
A–	3.667	
B+	3.333	
B	3.000	Good achievement
B–	2.667	
C+	2.333	
C	2.000	Satisfactory achievement
C–	1.667	
F	0.000	Failure
I		Incomplete
IP		In progress
NE		Not enrolled
NG		Grade not reported by faculty
S		Satisfactory (pass/fail basis; counts toward total degree requirements)
U		Unsatisfactory (pass/fail basis)
X		Incomplete (pass/fail basis)
L		Audit (no credit given)
T		Transfer
W		Course withdrawal

An I, IP, or X grade shows that the student has not completed the course requirements.

Note: In the College of Professional Studies, the incomplete, or I, grade may be given only when the student was approved to make up a single key requirement of a course, such as a paper or major report. The student and instructor must complete an Incomplete-Grade Contract (http://www.northeastern.edu/registrar/form-inc-grade.pdf) before the end of the course. The completed contract should be sent to the Office of Academic and Student Support Services for the signature from the Office of the Dean: 50 Nightingale Hall; fax 617.373.5545; email (cpsadviser@neu.edu). The university has a one-year-limit policy to make up incomplete grades. Students have access to their online course materials in Blackboard for up to one year.

The IP grade is intended for courses that extend over several semesters. The time restrictions on the incomplete grade do not apply to the IP grade. While the IP grade is left unchanged, it is not included in computing the grade-point average (GPA). If the IP grade is never changed, the course does not count toward graduation requirements.

Dropping Courses

Not attending class does not constitute withdrawal. Students receiving a grade of W or NE in any course are responsible for the costs associated with that course. Students must drop courses using processes described below.

IN FALL AND SPRING SEMESTERS

- Through the third week of the semester, students may withdraw without any grade being posted to the transcript. Courses may be dropped via the myNEU web portal (http://myneu.neu.edu/cp/home/displaylogin).
- Between the fourth week and the last day of classes, course withdrawals are indicated by a W on the student's record. Courses may be dropped via the myNEU web portal. (http://myneu.neu.edu/cp/home/displaylogin) No financial adjustment is made for courses receiving a W grade.
- After the last day of classes, no withdrawals are accepted for any reason. A letter grade for the course will be posted on the transcript.

- Dropping below full-time enrollment may affect financial aid, health insurance eligibility, and the maintenance of proper nonimmigrant visa status.

IN SUMMER HALF SEMESTERS

- Through the second week of the half semester, students may withdraw without any grade being posted to the transcript. Courses may be dropped via the myNEU web portal (http://myneu.neu.edu/cp/home/displaylogin).
- Between the third week and the last day of classes, course withdrawals are indicated by a W on the student's record. Courses may be dropped via the myNEU web portal (http://myneu.neu.edu/cp/home/displaylogin). No financial adjustment is made for courses receiving a W grade.
- After the last day of classes, no withdrawals are accepted for any reason. A letter grade for the course will be posted on the transcript.
- Dropping below full-time enrollment may affect financial aid.

Pass/Fail System

The individual schools and colleges state how and when the pass/fail system may be used.

Clearing an Incomplete or Changing Other Grades

An incomplete grade may be reported by the instructor when a student has failed to complete a major component of a required course, such as homework, a quiz or final examination, a term paper, or a laboratory project. Students can make up an incomplete grade by satisfying the requirements of the instructor or, if the instructor is absent, the chair of the department. Be aware that instructors' policies on the granting of incomplete grades may vary and that the final decision on an incomplete grade is up to the instructor. The period for clearing an incomplete grade and for changing a grade other than an incomplete or failure (F or U) is restricted to one calendar year from the date it is first recorded on the student's permanent record.

To clear an incomplete grade, a student must obtain an Incomplete-Grade Contract (http://www.northeastern.edu/registrar/form-inc-grade.pdf)on which the precise agreement for clearing an incomplete grade is specified and that is signed by the student and the instructor. The student must make an appointment with the instructor to arrange for clearing the incomplete grade. He or she must then complete the form, sign the agreement, and obtain the instructor's signature; leave a copy with the instructor, take one copy to the college academic student services office, and retain a copy as a personal receipt. Any exception to this policy on change of grades must be recommended by the Academic Standing Committee (ASC) of the college in which the course was offered and must be forwarded in writing by the ASC to the registrar for implementation. (Finishing the agreed-upon course work must be completed within one calendar year from the end of the semester in which the course was offered.)

Commencing with grades given in the fall of 1986, the university policy is that any grade outstanding for 12 or more months cannot be changed.

Any exception to this policy on change of grades must be recommended by the ASC of the college in which the course was offered and must be forwarded in writing by the dean to the registrar for implementation.

Repeating Courses

When the appropriate course is available, courses may be repeated in order to earn a better grade. In all cases, the most recent grade earned in a course is the one used in calculating the overall GPA; however, previous grades remain on the transcript followed by the word "Repeat." Consult your academic advisor before repeating a course. Students are required to pay normal tuition charges for all repeated course work.

Substituting Courses

In some cases, it may not be possible to repeat a course if a student wishes to do so. In certain, unusual circumstances, students may petition to substitute one course for another they have already taken, as long as the subject matter of both courses is substantially alike. With the approval of the student's academic advisor and the agreement of the department that offered the first course taken, a grade received in the new course will be labeled "Substitute" on the transcript and will be treated in the GPA calculation as a "repeat" grade, as described above. The original grade will remain on the student's Northeastern transcript. Consult your academic advisor before enrolling in any proposed substitute course. Students are required to pay normal tuition charges for all substitute course work.

Audit Policy

Graduate students may, with permission, audit one class per term with no additional charge. Students are permitted to petition from the end of the course-add period to the end of the third week of classes. Permission is based on the availability of a seat in the class and is at the discretion of the instructor and college.

Students must obtain advisor approval and meet the prerequisites and any other required approvals for the class. Instructor permission as well as approval by the associate dean of the college offering the course is required. The course work required is at the discretion of the instructor. Once a student opts to audit a course, the audit status of the course cannot be changed. A signed Petition to Audit must be presented to the Office of the Registrar during the designated audit-add period. Excluded courses are co-op, labs, language courses, any off-campus course, any online course, and any course required for the major or degree. Audits carry no academic credit.

Clearing an Academic Deficiency

An academic deficiency occurs when a student fails to complete a course with a satisfactory grade. The deficiency may occur because the student has failed the course or because the student has passed the course but with a grade that does not meet the minimum required by the student's program.

Students who have academic deficiencies may be required to clear them before progressing within the curriculum, especially if the course work is a prerequisite for future course work. Deficiencies can affect the student's expected year of graduation.

With the approval of the appropriate program faculty and/or academic advisor, students can clear deficiencies in the following ways:

1. Repeat the same course at one of Northeastern's colleges, which will result in a "repeat" grade (see "Repeating Courses" policy above).
2. Substitute a comparable course at one of Northeastern's colleges, which will result in a "repeat" grade.

Appeal of Final Grades

Under certain circumstances, students have the right to appeal final grades given by either academic faculty or cooperative education coordinators. Criteria and procedures can be found under Appeals Policies and Procedures.

GPA

Numerical equivalents for scholastic averages are weighted according to the number of hours the course carries. For example, suppose a student

receives a grade of B in a course carrying 4 semester hours and a grade of A in a course carrying 1 semester hour. The weightings for these example courses are as follows:

Grade	Numerical Equivalent	Semester Hours	Weight
B	3.000	4	12
A	4.000	1	4
Totals:		5	16

The GPA for both courses would then be the total weight (16) divided by the total semester hours (5), or 3.200. Grades of I, IP, S, U, and X are not included in the calculation of the GPA.

Minimum Cumulative GPA

Grades submitted to satisfy, in whole or in part, the requirements for any graduate degree or certificate of advanced study must yield a cumulative GPA of 3.000 or higher. This requirement may be supplemented by additional restrictions established by the graduate program or the college's graduate office such as, but not limited to, the maximum number of individual courses with grades below 3.000 that may be obtained without being required to withdraw or a minimum GPA in each semester.

Students falling below 3.000 are placed on academic probation. If the student remains on academic probation for two semesters, he or she may be terminated from the graduate program.

Not more than two courses or 6 semester hours of credit, whichever is greater, may be repeated to satisfy the requirements for the degree. The last grade earned in each of these repeated courses is counted in the calculation of the cumulative GPA.

Any incomplete grades must be made up within one calendar year from the semester in which the student took the class that resulted in the incomplete course grade.

More information regarding course grading and academic disputes may be found at "Academic Appeals" under "Appeals Policies and Procedures."

Grade Reports

Grades are available to students approximately three days after the end of each semester via the myNEU web portal (http://myneu.neu.edu/cp/home/displaylogin). A missing grade means that none was received from the instructor. Grades received late from faculty are processed as they are received.

Transcripts

Currently enrolled students may obtain unofficial transcripts from the myNEU web portal (http://myneu.neu.edu/cp/home/displaylogin) and may also order official transcripts through myNEU. For further information on transcript requests, visit the registrar's website. (http://www.northeastern.edu/registrar/trans_request.html) All questions concerning transcript requests should be directed to 617.373.2300, (TTY) 617.373.5360.

Northeastern University Course Numbering

UNDERGRADUATE

0001–0999	**Orientation and basic**
	No degree credit
1000–1999	**Introductory level (first year)**
	Survey, foundation, and introductory courses, normally with no prerequisites and designed primarily for students with no prior background
2000–2999	**Intermediate level (sophomore/junior year)**
	Normally designed for sophomores and above but in some cases open to freshman majors in the department
3000–3999	**Upper-intermediate level (junior year)**
	Designed primarily as courses for juniors; prerequisites are normally required, and these courses are prerequisites for advanced courses
4000–4999	**Advanced level (senior year)**
	Designed primarily for juniors and seniors; also includes specialized courses such as research, capstone, and thesis

GRADUATE

0001–0999	**Orientation and basic**
	No degree credit
5000–5999	**First-level graduate**
	Courses primarily for graduate students and qualified undergraduate students with permission
6000–6999	**Second-level graduate**
	Generally for master's and clinical doctorate only
7000–7999	**Third-level graduate**
	Master's- and doctoral-level courses; includes master's thesis
8000–8999	**Clinical/research/readings**
	Includes comprehensive exam preparation
9000–9999	**Doctoral research and dissertation**

Maintenance of Student Records

The university registrar is responsible for ensuring appropriate maintenance and safekeeping of student records. The transcript, which is stored electronically and maintained indefinitely, is the holistic record of student attendance and degree progress. In the event that the university discontinues operations, the archive of student records would be maintained by:

Massachusetts Department of Higher Education
One Ashburton Place
Room 1401
Boston, MA 02108

Course Cancellations

Northeastern University reserves the right to cancel any course if minimum enrollments, appropriate faculty, or academic facilities do not meet standards.

Final Examinations and Related Policies on Other Exams

All final examinations, term papers, or projects must be returned to the student or be retained by the department for a period of one year.

Graduation Requirements

All eligible degree candidates must complete the graduation application by the applicable deadline. Before you apply to graduate through your myNEU account, we recommend you take the time to review your current program information, i.e., degree, major, and concentration. To review this information, log in to your myNEU account; under the "Self-Service" tab click "Student Self-Service."

Family Educational Rights and Privacy Act (FERPA)

FERPA for Students—General Information

FERPA is a federal law that applies to educational institutions. Under FERPA, schools must allow students who are 18 years or over or attending a postsecondary institution:

- Access to their education records
- An opportunity to seek to have the records amended (see the *Student Handbook* for this procedure)
- Some control over the disclosure of information from the records

FERPA General Guidance for Parental Disclosure

When a student turns 18 years of age or attends a postsecondary institution, the student, and not the parent, may access, seek to amend, and consent to disclosures of his or her education records.

If you are an undergraduate day student and you choose not to share information with your parents, Northeastern will, if asked, indicate that you have restricted access to your records.

Release of Directory Information

The primary purpose of directory information is to allow Northeastern University to confirm attendance for employers, health insurance companies, and loan agencies. Northeastern may disclose appropriately designated "directory information" without written consent, unless you have advised the university to the contrary in accordance with the procedures below. If you choose not to release directory information, all communications with all third parties and agencies will need to be done through your written request to the university or in person.

As of June 30, 2016, Northeastern directory information includes:

- Student name
- Home address (city, state, country only)
- Major field of study
- College
- Class year
- Enrollment status (e.g., undergraduate or graduate, full-time or part-time)
- Dates of attendance
- Degrees, honors, and awards received
- Most recent educational agency or institution attended
- Sports activity participation, showing weight/height of members of athletic teams
- Participation in officially recognized activities

If Northeastern currently has permission to release data and you do not want the university to disclose directory information without your prior written consent, you must notify the university by coming to the Office of the Registrar, 271 Huntington Avenue.

Notification of Rights under FERPA

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. These rights are:

1. The right to inspect and review the student's education records within 45 days of the day the university receives a request for access. Students should submit to the registrar, dean, or head of the academic department (or appropriate official) written requests that identify the record(s) they wish to inspect. The university official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the university official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.
2. The right to request the amendment of the student's education record that the student believes is inaccurate or misleading. Students may ask the university to amend a record that they believe is inaccurate or misleading. They should write the university official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading. If the university decides not to amend the record as requested by the student, the university will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.
3. The right to consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent. One exception, which permits disclosure without consent, is disclosure to school officials with legitimate educational interest. A school official is defined as a person employed by the university in an administrative, supervisory, academic, or support staff position (including law enforcement unit and health staff); a person or company with whom the university has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a person assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the university to comply with the requirements of FERPA. At Northeastern, the Office of the University Registrar, 271 Huntington Avenue, administers FERPA.

Additional Information

Additional information can be obtained at the U.S. Department of Education's website (http://www.ed.gov/policy/gen/guid/fpco/ferpa) or by writing to:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW
Washington, D.C. 20202-5920

Student Right-to-Know Act

For information about the Student Right-to-Know Act, visit the registrar's website. (http://www.northeastern.edu/registrar/right-to-know.html)

Code of Student Conduct

The Code of Student Conduct is online at the Office of Student Conduct and Conflict Resolution (http://www.northeastern.edu/osccr/code-of-student-conduct) website.

Appeals Policies and Procedures

Graduate Student Appeals Procedures

Northeastern University affirms that it is essential to provide an appeals mechanism to students who believe that they have been erroneously, capriciously, inappropriately, or otherwise unfairly treated.

Academic Appeals

It is the policy of the university that all students shall be treated fairly with respect to evaluations made of their academic performance, standing, and progress. The university presumes that academic judgments by its faculty are fair, consistent, and objective. Students must understand that the substitution of a different academic judgment for that of the original evaluator is a serious intrusion upon teaching prerogatives. Nonetheless, the university believes it is essential to provide an appeals mechanism to students who believe that they were erroneously, capriciously, or otherwise unfairly treated in an academic or cooperative education determination. This includes claims of misinterpretation or inequitable application of any academic provision of the student handbook or *Faculty Handbook.* Issues concerning admission or readmission into a program cannot be appealed beyond the college level.

Before invoking the appeals procedures, students are always encouraged to speak informally to their instructors or academic advisors about any determination or grade about which they have questions. If students choose to pursue an appeal, the process is described in the appeals section that follows.

Scientific or Research Misconduct

Scientific or research misconduct is defined as fabrication, falsification, plagiarism, or other practices that seriously deviate from those that are commonly accepted within the academic and scientific community for proposing, conducting, or reporting research and does not include honest error or honest differences in interpretation or judgments of data. (Further information can be obtained from the U.S. Office of Research Integrity, Department of Health and Human Services (http://www.ori.dhhs.gov.). Possible incidences of misconduct are to be reported immediately to the vice provost for graduate education, who will initiate the appropriate procedures. Findings of scientific or research misconduct cannot be appealed through the process below.

Nonacademic Appeals

It is the policy of the university that all students shall be treated with respect and that all evaluations of their employment performance will be fair, consistent, and objective. This includes claims of misinterpretation or inequitable application of any employment provision of the student handbook. The student is always encouraged to speak informally to his or her supervisor about any determination about which he or she has questions prior to invoking the appeals procedures.

If the student chooses to pursue an appeal, the process is described in the appeals section that follows.

Appeal of Final Grades

It is the policy of the university that all students will be treated fairly in evaluations made of their academic performance, standing, and progress. The university presumes that academic judgments by its faculty are fair, consistent, and objective. Students must understand that the substitution of a different academic judgment for that of the original evaluator is a serious intrusion upon teaching prerogatives. Nonetheless, the university believes it is essential to provide an appeals mechanism to students who believe that they were erroneously, capriciously, or otherwise unfairly treated in an academic or cooperative education determination. This includes claims of misinterpretation or inequitable application of any academic provision of the university's undergraduate or graduate catalog, student handbook, or *Faculty Handbook.* However, graduate student issues involving admission or readmission in a program cannot be appealed beyond the college level.

In most cases, students should first discuss their concerns with the faculty member who taught the course to see if it is possible to reach agreement on the issue(s). If the student is not satisfied with the outcome of this discussion, or if the student is not comfortable discussing the issue with the instructor, the student should request a meeting with the department chair, or a person named by the chair, to attempt a department-level resolution of the appeal. If these informal attempts to resolve the issue fail, the student can enter the formal procedure at the college level as follows.

STEP 1

A student may appeal an academic determination by submitting a written statement (the Statement) that specifies the details of the action or judgment. This Statement should include when the problem occurred, who was involved, the basis of the appeal, and the resolution sought by the student. For students in the College of Professional Studies (CPS), the Statement is submitted to the school official designated by the Vice President for Professional and Continuing Studies. Graduate students (other than CPS) should submit the Statement to the graduate coordinator in the department (where one exists). If there is no department-level coordinator, the appeal should proceed to Step 2. All appeals of grades should be initiated and resolved before the student graduates. If a student wishes to dispute a grade in his or her final term, this must be done within forty-five calendar days of graduation. If the appeal concerns a cooperative education determination, it is submitted to the dean of the college in which the student is enrolled. The Statement must specify the details of the action or judgment and the basis for the appeal. All parties shall cooperate and act expeditiously in processing the appeal to completion.

Though students are always entitled to seek the advice of legal counsel, students may not be represented by a lawyer in the informal or formal academic appeal procedures. A student may consult with the Vice Provost for Graduate Education, Vice President for Professional and Continuing Studies (in the case of CPS students), or their designees at any point in this procedure for advice or assistance. The dean, vice president, or provost may take whatever steps they deem reasonably appropriate to achieve voluntary resolution of the problem at any stage of these procedures.

The Statement should be submitted within twenty-eight working days (or twenty working days [four calendar weeks] for CPS students) of the day when the student learns of the academic determination in question. For course grade appeal in the CPS, the Statement must be submitted within twenty days after grades are posted to the student academic

record. Grades are typically available the Tuesday after the term ends and are viewable through the student's myNEU account.

If a student feels that he or she has been the victim of harassment or of discrimination prohibited by law or by university policy, he or she should consult with the Office of Institutional Diversity and Equity as soon as he or she becomes aware of alleged prohibited harassment or discrimination and is not required to wait until a term grade or determination is received before seeking advice or redress. If the Office of Institutional Diversity and Equity is advised of such alleged prohibited conduct as part of an academic appeal (see below), the appeal shall be pursued and investigated first through the Office of Institutional Diversity and Equity. In such cases, the student should submit the appeal to the appropriate dean(s) described in this step, with a copy also given to the Office of Institutional Diversity and Equity. Following a resolution of the sexual harassment/discrimination issues, any remaining academic issues will be addressed, at the request of the student, according to the academic appeals procedures.

STEP 2

The dean or CPS vice president shall respond to the student in writing, including specific instructions for the student to seek an informal resolution to the matter, unless such course of action, as outlined by the student in his or her Statement, is demonstrably futile. These directions shall include discussing the matter with the person whom the student identifies as involved in the matter. If the student is not satisfied with the informal resolution, the dean or CPS vice president shall discuss the matter with the department chair (where one exists), graduate coordinator, consultant, program director, or associate dean (as appropriate) or equivalent supervisor and the dean of the college in which the faculty member involved in the matter serves, who shall attempt to effect an informal resolution. The student shall also have the right to discuss the matter with the chair (where one exists) or equivalent supervisor in which department the faculty member involved in the matter serves.

If the appeal involves allegations of prohibited harassment or discrimination, the dean shall consult with the Office of Institutional Diversity and Equity before making this response and shall, as part of this response, explain the role that the Office of Institutional Diversity and Equity will play in steps 2 and 3 of this procedure.

A copy of this response shall be sent to the department chair or equivalent supervisor of the appropriate unit.

STEP 3

If the appeal cannot be resolved informally within thirty calendar days of the student's original submission of his or her Statement to the dean or CPS vice president, or if he or she is not satisfied with the disposition of the matter at Step 2, the student may proceed with the appeal through his or her college's or school's established academic appeals procedure. The dean or the academic standing committee, as applicable, must provide the student and the involved faculty member with a written report of the finding(s) and decision.

This step involves a review by an academic standing committee making the recommendation to the dean or CPS vice president. The student may obtain a copy of the operating rules of the academic standing committee from the dean of the college involved.

In appeals involving allegations of prohibited harassment or discrimination, the dean or academic standing committee shall receive a report of the findings of the investigation of the Office of Institutional Diversity and Equity for incorporation into its own report on matters left unresolved by that finding that were referred to it. The dean/CPS vice president or committee shall be without authority to reverse or modify the Office of Institutional Diversity and Equity finding(s) or resolution.

STEP 4

If the student or the involved faculty member is not satisfied with the dean's or CPS vice president's disposition of the matter or if the appeal is not resolved within thirty calendar days after originally submitted to the dean or CPS vice president pursuant to step 1, he or she may further pursue the matter by requesting in writing within fourteen calendar days that the university convene an academic appeals resolution committee to review the issue. Students may obtain information on this process in either the Office of the Vice President for Student Affairs (104 Ell) or the Office of the Provost (110 CH). This committee has been designated as the final authority on these matters. This request must be made within fourteen calendar days of the finding of the academic standing committee in step 3.

1. ***Academic Appeals Resolution Committee***
   The academic appeals resolution committee includes:
   - The Vice Provost for Graduate Education or a designee.
   - The student's faculty advisor will be appointed by the appropriate vice provost except in cases where no specific advisor exists, or where the faculty advisor is involved in the dispute. In those cases, a faculty member from the student's major college, department, or area of specialization will be appointed.
   - Two faculty members appointed by the Faculty Senate Agenda Committee (if the appeal is based on a cooperative education determination, one of the faculty members shall be a member of the cooperative education faculty, but not from the student's area of study) and a representative of the Office of Institutional Diversity and Equity (if the appeal had at any point involved a matter of sexual harassment/discrimination).
   - The chair shall be elected from among the committee's three faculty members but cannot be the student's faculty advisor.
2. ***Preliminary Matters***
   If the academic appeals resolution committee determines, by a majority vote, that the appeal is patently without substance or merit, it may dismiss the appeal.
3. ***Investigation***
   The academic appeals resolution committee shall investigate the matter under appeal as quickly as possible by studying the relevant documents, interviewing the parties (especially the student and the involved faculty member), and taking any other action it deems appropriate. At no time shall the committee be bound by rules of evidence but shall at all times conduct itself in a manner that is not arbitrary or capricious. The academic appeals resolution committee may, but is not required to, hold a hearing prior to resolving the issues. However, in all instances, the student and the involved faculty member shall have the right to appear and testify separately and privately before the academic appeals resolution committee. The student shall have the right to have an advocate from the university community present during his or her testimony to the academic appeals resolution committee.
4. ***Authority to Act***
   The academic appeals resolution committee has been designated as the final authority on these matters. At the conclusion of its investigation, the academic appeals resolution committee shall resolve, by majority vote, the issue by either upholding the finding of the academic standing committee or dean/CPS vice president, in

which case no further appeal is available, or granting such relief to the student as the appeals resolution committee deems appropriate.

a. The academic appeals resolution committee may not determine a resolution that contradicts the prior findings or actions of the Office of Institutional Diversity and Equity with respect to elements of this appeal.

b. In the event of a tie vote, the action of the academic standing committee or dean/CPS vice president shall be considered upheld.

5. ***Resolution***
   All direct parties to the appeal, including but not limited to the student, the CPS vice president or provost, the dean, the department chair or equivalent supervisors, graduate coordinator or equivalent supervisor, and the faculty member shall be promptly informed in writing of the decisions and actions taken (i.e., the Report) during this academic appeals procedure.
6. ***Report***
   A written Report of the appeal and its resolution shall be submitted by the chair of the academic appeals resolution committee to the student, the involved faculty member, the Faculty Senate Agenda Committee, the vice president for student affairs, the appropriate vice provost, the registrar, and the dean or CPS vice president, as appropriate.
7. ***Action***
   The dean(s) or CPS vice president or his or her designee in the involved college(s) shall take whatever action is necessary to implement fully the resolution of the academic appeals resolution committee. This includes reporting the change of grade to the registrar.
8. ***Appeal***
   No further appeal can be instituted by the student or the involved faculty member with respect to the issue(s) raised at any level of the formal appeals resolutions procedures once adjudicated.

General Regulations

Review the general regulations that follow as well as all other regulations or limitations included throughout this catalog. Your success at Northeastern depends, in part, on understanding your rights and fulfilling your responsibilities.

Legal Rights and Responsibilities

GRIEVANCE PROCEDURE FOR DISABLED STUDENTS

It is the policy of Northeastern University to comply with all laws governing access by and discrimination against disabled students. Accordingly, any student who believes that there has been a violation of these laws is encouraged to discuss the matter with the director of the Disability Resource Center and other persons identified by the director, or with the director of the Office of Institutional Diversity and Equality, to resolve the matter in a prompt and equitable manner. If such discussions do not resolve the matter, the student may then initiate a grievance by taking the steps outlined below.

1. All grievances made by students on the basis of being disabled are considered as being made to the president of the university.
2. In the case of a grievance, the student should discuss the objection with the individual responsible for the office or department where the objection was initially raised.
3. If not satisfied, the student should discuss the objection with the dean of the college or director under which the department falls.
4. If the grievance is not satisfactorily resolved, the student should complete a grievance form and file a written request for a formal hearing with the Grievance Committee for Disabled Students. The request should be filed with the vice president for student affairs. Upon receipt of a written request for a formal hearing, the grievance committee (including one faculty member from the student's college, one faculty member not from the student's college, one representative from the Disability Resource Center, a representative from the Office of Institutional Diversity and Equality, the vice president for student affairs or a designee, and another administrator not from student affairs) must hold a hearing within three calendar weeks. The grievance committee must allow a full and fair opportunity for the presentation of evidence relevant to the reason(s) for the hearing request and must render a decision in writing to the requesting student within one week of the conclusion of the hearing. The director of the Office of Institutional Diversity and Equality is compliance officer for Section 504 of the Rehabilitation Act of 1973.

GRIEVANCE PROCEDURE—SEXUAL HARASSMENT

No employee, agent, supervisory personnel, or faculty member shall exercise his or her responsibilities or authority in such manner as to make submission to "sexual advances, requests for sexual favors, or other verbal or physical conduct of a sexual nature" as an explicit or implicit term or condition of evaluation, employment, admission, advancement, or reward within the university. Neither shall any employee, agent, supervisory personnel, or faculty member make submission to or rejection of such conduct the basis for employment or academic decisions affecting any employee or student. Neither shall any employee, agent, supervisory personnel, or faculty member conduct himself or herself with respect to verbal or physical behavior of a sexual nature where such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive work or classroom environment.

Though sexual harassment will not be tolerated, the university recognizes that it is difficult to regulate emotional relationships between consenting adults. However, a consensual relationship may be suspect in instances in which one of the individuals has authority over the other. Therefore, no faculty or employee involved romantically or sexually with a student may teach or supervise that person either individually or as part of a group in any activity connected to the university.

Any student, teaching assistant, employee, or faculty member who feels that he or she has been the victim of sexual harassment may bring the matter to the attention of the director of the Office of Institutional Diversity and Equality. Copies of the sexual harassment grievance procedure can be obtained from the Office of Institutional Diversity and Equality, 424 Columbus Place.

HAZING—CHAPTER 269 OF THE MASSACHUSETTS GENERAL LAWS

Section 17. Whoever is a principal organizer or participant in the crime of hazing, as defined herein, shall be punished by a fine of not more than three thousand dollars or by imprisonment in a house of correction for not more than one year, or both such fine and imprisonment. The term hazing as used in this section and in sections eighteen and nineteen, shall mean any conduct or method of initiation into any student organization, whether on public or private property, which willfully or recklessly endangers the physical or mental health of any student or other person. Such conduct shall include whipping; beating; branding; forced calisthenics; exposure to weather; forced consumption of any food, liquor, beverage, drug, or other substance; or any other brutal treatment or forced physical activity which is likely to adversely affect the physical health or safety of any such student or other person, or

which subjects such student or other person to extreme mental stress, including extended deprivation of sleep or rest or extended isolation. Notwithstanding any other provisions of this section to the contrary, consent shall not be available as a defense to any prosecution under this action.

Section 18. Whoever knows that another person is the victim of hazing as defined in section seventeen and is at the scene of such crime shall, to the extent that such person can do so without danger or peril to himself or others, report such crime to an appropriate law enforcement official as soon as reasonably practicable. Whoever fails to report such crime shall be punished by a fine of not more than one thousand dollars.

Section 19. Each institution of secondary education and each public and private institution of postsecondary education shall issue to every student group, student team, or student organization that is part of such institution or is recognized by the institution or permitted by the institution to use its name and facilities or is known by the institution to exist as an unaffiliated student group, student team, or student organization, a copy of this section and sections seventeen and eighteen; provided, however, that an institution's compliance with the section's requirements that an institution issue copies of this section and sections seventeen and eighteen to unaffiliated student groups, teams, or organizations shall not constitute evidence of the institution's recognition or endorsement of said unaffiliated student groups, teams, or organizations.

Each such group, team, or organization shall distribute a copy of this section and sections seventeen and eighteen to each of its members, plebes, pledges, or applicants for membership. It shall be the duty of each such group, team, or organization, acting through its designated officer, to deliver annually to the institution an attested acknowledgement stating that such group, team, or organization has received a copy of this section and said sections seventeen and eighteen, that each of its members, plebes, pledges, or applicants has received a copy of sections seventeen and eighteen, and that such group, team, or organization understands and agrees to comply with the provisions of this section and sections seventeen and eighteen. Each institution of secondary education and each public or private institution of postsecondary education shall, at least annually, before or at the start of enrollment, deliver to each person who enrolls as a full-time student in such institution a copy of this section and sections seventeen and eighteen.

Each institution of secondary education and each public or private institution of postsecondary education shall file, at least annually, a report with the regents of higher education and, in the case of secondary institutions, the board of education, certifying that such institution has complied with its responsibility to inform student groups, teams, or organizations and to notify each full-time student enrolled by it of the provisions of this section and sections seventeen and eighteen and also certifying that said institution has adopted a disciplinary policy with regard to the organizers and participants of hazing and that such policy has been set forth with appropriate emphasis in the student handbook or similar means of communicating the institution's policies to its students. The board of regents and, in the case of secondary institutions, the board of education shall promulgate regulations governing the content and frequency of such reports and shall forthwith report to the attorney general any such institution that fails to make such report.

STUDENT RIGHT-TO-KNOW AND CAMPUS SECURITY ACT

In compliance with the Student Right-to-Know and Campus Security Act, information regarding graduation rates may be obtained in the Office of the Registrar, 271 Huntington Avenue, and in the Department of Athletics, 219 Cabot Physical Education Center; information regarding safety and security may be obtained in the Office of Admissions and the Public Safety Division, 100 Columbus Place. It is Northeastern University's policy to disclose to an alleged victim of any crime of violence the results of any disciplinary proceeding against the alleged perpetrator of such crime. Further information is available in the Office of Student Conduct and Conflict Resolution, 202 Ell Hall.

USE OF ALCOHOL AND DRUGS

The unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in or on any Northeastern property. Any university employee or student determined to have violated this policy may be subject to disciplinary action up to and including dismissal. The use of alcohol while on Northeastern property is prohibited except where specifically authorized by the university. No employee may report to work while under the influence of alcohol or illegal drugs. Violation of these regulations may be reason to require evaluation/treatment for substance abuse in coordination with the University Center for Counseling and Student Development and/or for disciplinary action up to and including dismissal. Northeastern University works to provide a drug-free workplace for all university employees and students. The Center for Counseling and Student Development provides resources for treatment and referral for students and employees with substance abuse problems. Educational programs for students, employees, and managers are presented through Human Resources Management, the Office of Residential Life, and the Center for Counseling and Student Development and cover the dangers of alcohol and drug abuse, the availability of assistance for counseling and rehabilitation, and penalties for violating university policies. To comply with federal law, the university requires that employees directly engaged in performance of a grant or contract must notify their employers of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after the conviction. The university must notify any federal contracting agency within ten days of having received notice that an employee engaged in the performance of such contract has had a criminal drug statute conviction for a violation occurring in the workplace. The university will take appropriate action up to and including dismissal and/or require participation in an approved abuse assistance or rehabilitation program.

USE OF WEAPONS

The use or possession on campus of firearms, explosive agents of any kind, as well as chemicals, mace, and tear gas, is specifically forbidden by the Code of Student Conduct. Violation of this university policy is cause for disciplinary action up to and including expulsion. In addition, it is worth noting that Massachusetts law states: "Whoever, not being a law enforcement officer and notwithstanding any license obtained by him under the provisions of chapter one hundred and forty, carries on his person a firearm as hereinafter defined, loaded or unloaded, in any building or on the grounds of any college or university without the written authorization of the board or officer in charge of said college or university shall be punished by a fine of not more than one thousand dollars or by imprisonment for not more than one year or both. For the purpose of this paragraph, 'firearm' shall mean any pistol, revolver, rifle, or smoothbore arm from which a shot, bullet, or pellet can be discharged by whatever means."

Massachusetts general law prohibits the possession of nunchaku or karate sticks; switchblades; knives; starter's pistols; ammunition; leather armbands or other clothing that has metallic spikes, points, or studs; or other dangerous weapons or articles. A student who possesses any

articles for sporting purposes (for example, bow and arrows) should check with the University Police Department or the Department of Residential Life to determine whether such articles are among those prohibited by statute or university regulation. Northeastern University also prohibits the possession of knives other than food utensils.

Policies and Procedures

ACADEMIC INTEGRITY POLICY

Essential to the mission of Northeastern University is the commitment to the principles of intellectual honesty and integrity. Academic integrity is important for two reasons. First, independent and original scholarship ensures that students derive the most from their educational experience and the pursuit of knowledge. Second, academic dishonesty violates the most fundamental values of an intellectual community and depreciates the achievements of the entire university community.

Accordingly, Northeastern University views academic dishonesty as one of the most serious offenses that a student can commit while in college. The following is a broad overview of what constitutes academic dishonesty but is not meant to be an all-encompassing definition.

Cheating

Defined as intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise. Examples:

- Unauthorized use of notes, text, or other aids during an examination
- Copying from another student's examination, research paper, case write-up, lab report, homework, computer disc, and so on
- Talking during an examination
- Handing in the same paper for more than one course without the explicit permission of the instructor
- Perusing a test before it is given
- Hiding notes in a calculator for use during an examination

Fabrication

Defined as intentional and unauthorized falsification, misrepresentation, or invention of any information, data, or citation in an academic exercise. Examples:

- Making up the data for a research paper
- Altering the results of a lab experiment or survey
- Listing a citation for a source not used
- Stating an opinion as a scientifically proven fact

Plagiarism

Defined as intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise without providing proper documentation of source by way of a footnote, endnote, or intertextual note. The following sources demand notation:

- Word-for-word quotation from a source, including another student's work
- Paraphrase: using the ideas of others in your own words
- Unusual or controversial facts—facts not apt to be found in many places
- Interviews, radio and television programs, and telephone conversations

Unauthorized Collaboration

This refers to instances when students, each claiming sole authorship, submit separate reports that are substantially similar to one another. While several students may have the same source material (as in case write-ups), the analysis, interpretation, and reporting of the data must be each individual's.

Participation in Academically Dishonest Activities

Examples:

- Stealing an examination
- Purchasing a prewritten paper through a mail-order or other service, including via the internet
- Selling, loaning, or otherwise distributing materials for the purpose of cheating, plagiarism, or other academically dishonest acts
- Alteration, theft, forgery, or destruction of the academic work of other students, library materials, laboratory materials, or academic records including transcripts, course registration cards, course syllabi, and examination/course grades
- Intentionally missing an examination or assignment deadline to gain an unfair advantage

Facilitating Academic Dishonesty

Defined as intentionally or knowingly helping or attempting to violate any provision of this policy. Examples:

- Inaccurately listing someone as coauthor of a paper, case write-up, or project who did not contribute
- Sharing with another student a take-home examination, homework assignment, case write-up, lab report, and so on, without expressed permission from the instructor
- Taking an examination or writing a paper for another student

All members of the Northeastern University community—students, faculty, and staff—share the responsibility to bring forward known acts of apparent academic dishonesty. Any member of the academic community who witnesses an act of academic dishonesty should report it to the appropriate faculty member or to the director of the Office of Student Conduct and Conflict Resolution. The charge will be investigated and if sufficient evidence is presented, the case will be referred to the Northeastern University Student Judicial Hearing Board. If found responsible for an academic dishonesty violation, a minimum sanction of deferred suspension will follow. If found responsible for a second violation, the student will be expelled from the university.

APPROPRIATE USE OF COMPUTER AND NETWORK RESOURCES POLICY

The information systems of Northeastern University are intended for the use of authorized members of the Northeastern community in the conduct of their academic and administrative work. To protect the integrity of computer resources against unauthorized or improper use, and to protect authorized users from the effects of unauthorized or improper usage, the university reserves the right, with or without notice, to monitor, record, limit, or restrict any account holder's usage. The university may also monitor, record, inspect, copy, remove, or otherwise alter any data, file, or system resources. The university reserves the right to periodically check these systems and to take any other action necessary to protect the computer and network facilities. The university also retains access rights to all files and electronic mail on its computing and network facilities. Anyone using these systems or networks expressly consents to such monitoring.

Any unauthorized, inappropriate, illegal, or illegitimate use of the university's computing resources, or failure to comply with these guidelines, shall constitute a violation of university policy and will subject the violator to disciplinary action by the university and may result in legal action. When a violation is identified, the appropriate system manager or unit head will undertake a review and initiate action in accordance with university policy. In addition, the university may require restitution for

any use of computer or network services that violate these guidelines. The university may also provide evidence of possible illegal or criminal activity to law enforcement authorities.

Notwithstanding any other provision of this policy, authorization to access the information systems of Northeastern University ends at the termination of employment, the end of a recognized role or relationship, or the loss of sponsorship. Students may continue to use their Northeastern electronic mail account for up to six months after graduation. Any questions about this policy or the applicability of this policy to a particular situation should be referred to the information technology security manager or the director of internal audit. The university's information systems consist of all networking wiring, equipment, networks, security devices, servers, computer systems, computers, computer laboratory equipment, workstations, internet connections, and all other intermediary equipment, services, and facilities. These assets are the property of Northeastern University.

1. Access to and use of Northeastern information systems is a privilege granted by the university to its faculty, staff, and students. Access for up to one academic year for others, including "sponsored" individuals whose relationship with Northeastern is a result of a university-recognized affiliation or relationship, must be approved by the authorizing unit's dean or vice president. Such access may not be renewed without the written approval of the senior vice president for administration and finance.
   The university retains sole discretion over the extent to which access privileges are granted.
2. Users may only use those computer accounts that have been authorized by the university for their use. Use of another person's account, security devices, and/or the presentation of false or misleading information or credentials for the purpose of obtaining access to information systems is prohibited.
3. Users are responsible for all use of information systems conducted under their user ID(s) and are expected to take all precautions including password security and file protection measures to prevent use of their accounts and files by unauthorized persons. Sharing of passwords is prohibited.
4. Users may not offer, provide, lend, rent, or sell access to university information systems. Users may not provide access to individuals outside the university community.
5. Use of university information systems for hosting nonuniversity activities must have the explicit written authorization of the senior vice president for administration and finance prior to the use.
6. While the university attempts to protect electronic communication and files from unauthorized access, this cannot be guaranteed. Users may not access, copy, or move files including, but not limited to, programs, data, and electronic mail that belong to another account without prior authorization from the account holder. Files may not be moved to other computer sites without permission from the holder of the account under which the files reside.
7. Users may not use remote resources such as printer and file systems, regardless of location on or off the Northeastern network, unless the administrator of the remote resource has first granted permission.
8. Northeastern information systems may be used for lawful purposes only. Users must not use their accounts or Northeastern information systems for unlawful purposes including, but not limited to, the installation of fraudulently or illegally obtained software; illegal dissemination of licensed software; sharing of content where the disseminator does not hold lawful intellectual property rights; propagating chain letters, pyramid, Ponzi, other unlawful or deceptive schemes; or for any purpose contrary to local, state, and/or federal law.
9. Use of university information systems must comply with the provisions of copyright law and fair use. Copyright law limits the right of a user to copy, edit, or transmit electronically another's intellectual property, including written materials, images, sounds, music, and performances, even in an educational context, without permission, except in compliance with the fair use doctrine exception.
10. Users are responsible for the timeliness, accuracy, and content/consequences of their web pages. Posting of personal, family, or other identifying information is at the sole discretion of the user. Users are advised to exercise discretion when posting personal information to minimize the risk to personal privacy and safety.
11. University information systems may not be used for commercial purposes, except only as permitted with explicit prior written approval of university counsel and the senior vice president for administration and finance.
12. Internet use must comply with the terms of service stipulated by our internet service provider(s). These policies are incorporated by reference. In addition, the acceptable use, terms of service, and/or other policies of the system(s) also bind users of the internet connection and resources to which they connect. At the time of writing, the internet service provider for Northeastern University is Genuity (http://www.genuity.com).
13. Users may not use information systems irresponsibly, wastefully, or in a manner that adversely affects the work or equipment of others at Northeastern or on the internet.
14. The university strives to maintain the security and privacy of all electronic communications and content passed on the Northeastern network and, therefore, will not arbitrarily or frivolously review or inspect user files or electronic mail. However, all electronic communications and content presented to and/or passed on the Northeastern network, including that presented to and/or passed to and from the internet connection(s), may be monitored, examined, saved, read, transcribed, stored, or retransmitted in the course of daily operations by any duly authorized employee or agent of Northeastern University in the exercise of their duties or by law enforcement authorities who are called upon to assist the university in investigating possible wrongdoing. Electronic communications and content may be examined by automated means. Further, Northeastern reserves the right to reject from the network electronic communications and content deemed not in compliance with policies governing the use of information systems at the university. By accessing Northeastern information systems, users give Northeastern permission to conduct each of the operations described above.
15. The confidentiality of any message or material should not be assumed. Even when a message or material is deleted, it may still be possible to retrieve and read that message or material. Further, the use of passwords for security does not guarantee confidentiality. Messages read in HTML may identify the reader to the sender. Aside from the right of the university to retrieve and read any electronic communications or content, such messages or materials should be treated as confidential by other students or employees and accessed only by the intended recipient. Without prior authorization, students and employees are not permitted to retrieve or read electronic mail messages that are not sent to them.
16. All users are required to honor and observe the rules of confidentiality and protection of privacy when accessing and using any information that resides on Northeastern information systems and/or any information that pertains to university programs, students, faculty, and staff. All disclosures of student information must comply with

the provisions of the Family Educational Rights and Privacy Act (FERPA) of 1974.

17. Northeastern reserves the right at any time, without prior notice or permission from the user or users of a computer or other Northeastern-owned computing device, to copy or have copied any and all information from the data-storage mechanisms of such devices, as may be required at the sole discretion of the university, in connection with investigations of possible wrongdoing.
18. The Appropriate Use of Computer and Network Resources Policy specifically prohibits the use of Northeastern University's information systems to:
    - Harass, threaten, defame, slander, or intimidate any individual or group.
    - Generate and/or spread intolerant or hateful material, which in the sole judgment of the university is directed against any individual or group, based on race, religion, national origin, ethnicity, age, gender, marital status, sexual orientation, veteran status, or disability.
    - Transmit or make accessible material, which in the sole judgment of the university is offensive, violent, pornographic, annoying, or harassing, including use of Northeastern information systems to access and/or distribute obscene or sexually explicit material unrelated to university-sanctioned work or bona fide scholarship.
    - Generate unsolicited electronic mail such as chain letters, unsolicited job applications, or commercial announcements.
    - Generate falsely identified messages or message content, including use of forged content of any description.
    - Transmit or make accessible password information.
    - Attempt to access and/or access information systems and/or resources for which authority has not been granted by the system owner(s).
    - Capture, decipher, or record user IDs and/or passwords.
    - Intercept electronic communications not intended for the recipient.
    - Probe, by any means, the security mechanisms of any resource on the Northeastern network or on any other network through a connection to the Northeastern network.
    - Disclose or publish, by any means, the security vulnerabilities of or the means to defeat or disable the security mechanisms of any resource connected to or part of the Northeastern University network.
    - Alter, degrade, damage, or destroy data.
    - Transmit computer viruses or malicious/destructive code of any description.
    - Conduct illegal, deceptive, or fraudulent activity.
    - Obtain, use, or retransmit copyrighted information without permission of the copyright holder.
    - Place bets, wagers, or operate games of chance.
    - Tax, overload, impede, interfere with, damage, or degrade the normal functionality, performance, or integrity of any device, service, or function of Northeastern information systems, content, components, or the resources of any other electronic system, network, service, or property of another party, corporation, institution, or organization.
    - The above enumeration is not all-inclusive. If there is a question as to whether a specific use is appropriate or acceptable under this policy, the university's sole determination shall prevail.
19. Use of Northeastern University information systems must comply with all applicable local, state, and federal laws, including, but not limited to, the following, which are incorporated by reference:
    - Massachusetts General Laws Chapter 266, Subsections 33(a) and 120(f), which impose sanctions for, among other acts, destroying electronically processed and stored data or gaining unauthorized access to a database or computer system.
    - United States Code, Title 18, Computer Fraud and Abuse Act, which imposes sanctions for, among other acts, knowingly accessing a computer without authorization or in excess of authorized access, knowingly causing damage to protected computers, or trafficking in password information.
    - United States Code, Title 18, Electronic Communications Privacy Act, which imposes sanctions for, among other acts, interception of wire, oral, or electronic communications.

BEHAVIOR ON CO-OP, ON EXTERNSHIPS, AND IN THE NEIGHBORHOOD

As an urban institution, Northeastern University is a part of the vibrant community and business life of the surrounding neighborhoods. Maintaining amicable and considerate relations between the university and local residents and businesses is essential to the continued cooperation of the university and its neighbors in civic projects and issues and to the furtherance of the university's broader mission to contribute to the general good of society. The university endeavors to foster conditions under which such beneficial relations exist. Consequently, the university must consider conduct on the part of members of the university community, whether on or off campus and whether isolated or continuing in nature, that is disruptive of these relations; that impairs, interferes with, or obstructs the lawful missions, processes, and functions of the university; or that is found by the university to be abhorrent or offensive to generally accepted standards of social behavior, as inimical to the university's interests.

The university's Code of Student Conduct governs student behavior on co-op, externships, and in the community surrounding the university. In addition, misbehavior in these settings may violate the law, policies of the co-op employer, or rules of the externship sponsor.

BICYCLES

Wherever possible, students should use the bike racks available at various locations on campus. Bicycles should not be chained to fences, doors, trees, or other objects, and under no circumstances may bicycles be brought into any university building. The fire code dictates that all entrances, exits, corridors, and stairwells must be free and clear at all times. Bicycles found in violation of this code will be removed from the area.

CARD PLAYING AND GAMBLING

The university does not permit card playing of any kind in classrooms unless it is a regularly scheduled activity of an organization recognized officially by the Office of Student Activities. Social card games are permitted in the residence halls and in the Curry Student Center. Students may not gamble, play pyramid games, or sell lottery tickets. Casino or other game events are permitted in designated areas that are approved by city and state laws, as part of properly scheduled events, and in strict accordance with regulations issued by the Office of the Vice President for Student Affairs.

COPYRIGHTABLE MATERIALS

It is the general policy of the university that student papers or projects submitted in partial fulfillment of course requirements remain the property of the student authors.

This policy does not apply to:

1. "Work for hire" as defined by intellectual property laws
2. Work derived wholly or in part from other patented or copyrighted material
3. Work done as part of external grants or contracts in which the contracting documents or regulations define ownership
4. Work in which the university or its agents or employees contribute substantial time or resources
5. Work considered a thesis or dissertation

The university owns the copyright to any work created or developed by one or more students with the significant use of funds, space, facilities, equipment, materials, or other university resources. The university will not normally construe the payment of salary from unrestricted funds or the provision of office and library facilities as constituting significant use of funds, space, facilities, equipment, materials, or other resources of or administered by the university. Use of laboratory and/or computer facilities or assistance from one or more faculty or staff members to a student author specifically pertaining to the work constitutes significant use of university resources. In all cases, the provost or his or her designee shall make a good-faith determination concerning significant use, which shall be final and binding on all parties.

In the case of a thesis generated by research performed in whole or in part by a student in the course of or pursuant to an agreement for sponsored research or other written agreement, including an agreement between the author(s) and the university, or utilizing equipment or facilities provided to the university under conditions that impose copyright restrictions, ownership or control shall be determined in accordance with such agreement or restrictions. In the absence of such agreement or restrictions, copyright ownership in such a thesis shall reside in the student. However, the student, as a condition of a degree award, must grant the university the royalty-free right to reproduce and publicly distribute copies of the thesis for limited and noncommercial purposes.

Where necessary to secure to the university an ownership of copyright, students shall assign such rights of copyright, or grant the specified rights of reproduction and distribution, to the university. The university reserves the right to employ, at its discretion, the materials or portions of any work created or developed in the course of an author's relationship with the university, or otherwise covered by the University Patent and Copyright Policy, for promotional, professional, or noncommercial purposes on a royalty-free basis. Certain courses taught at Northeastern University involve students in individual or group assignments or projects involving the creation of materials, objects, or techniques that may be patentable or copyrightable. These courses generally require extraordinary levels of faculty organization and participation and/or substantial university resources.

1. Individual teachers or academic units may require that originals or copies of such papers or projects be retained either temporarily or permanently by the individual teacher or by the unit.
2. A thesis is a student work representing significant original or independent research and for which the student receives a substantial amount of credit toward a degree or certificate. Where there is a question concerning whether or not a student's work is a thesis, the provost or his or her designee shall make a good-faith determination concerning same, which shall be final and binding on all parties.
3. Copies of the university patent and copyright policies are available from the Division of Research Development, 405 Lake Hall, 617.373.4587.

In accordance with university patent and copyright policies, in such courses the university is the owner of all rights in technology, computer programs, or other creative work that may be developed by the undergraduate or graduate student as part of the student's work in those courses. It is the university's intention, where applicable, to disclose and authorize the use of such technology, programs, or work to nonprofit organizations and to government agencies without a fee. The university may also have the opportunity to license such materials to a commercial enterprise, and in this event, it is the university's intention to share any revenue from such a license with student contributors in an amount determined in accordance with the then-existing university policy or plan. Students are informed early in the semester if the course in which they are enrolled falls within this category and will be asked to sign a letter of agreement. Should the student decline to sign an agreement, he or she will be assigned to another course section—one in which such agreement is not required—or will be given alternative activities not involving such assignments or projects.

COPYRIGHTS AND PATENTS

Any student who makes, as sole or joint inventor, an invention that involved significant use of university resources, including funds, space, facilities, equipment, or materials, or that is subject to terms of a sponsored research or other agreement between the university and another party, shall assign this invention and all associated applications and patents to the university or its designee unless the invention has been released to the inventor in accordance with the applicable provisions of the university patent policy. Any student, whether before or after terminating his or her association with the university, shall do whatever is necessary to enable the university or its designee to take out patents in any and all countries on such invention. The cost and expense of making such assignments and procuring such patents shall be borne by the university or its designee. When an invention is made by a student not involving significant use of funds, space, facilities, equipment, materials, or other resources of or administered by the university, the university will waive its rights, and the invention will be the exclusive property of the student, provided the student's rights in the invention are not altered by the terms of any financial aid received, including external sponsorship, scholarships, fellowships, traineeships, thesis expenses, or other assistance, whether or not administered by the university and provided the invention is not subject to third-party rights.

DEMONSTRATIONS

The university supports as fundamental to the democratic process the rights of all members of the university community to express their views and to protest actions or opinions with which there is disagreement. A university is where individuals express diverse ideas and viewpoints in an atmosphere free of any physical force. The university insists that all demonstrations be peaceful and orderly and abide by university regulations.

- Demonstrators must not block corridors or entrances or use loud noise to disrupt a conference, meeting, or assembly.
- Demonstrations may not be conducted in faculty or administrative offices, classrooms, libraries, or study areas.
- Moving picket lines in university corridors are prohibited. (Protests may be registered by individuals or groups standing in a single line against a corridor wall, but corridors must be kept open at all times for the free passage of other members of the community.)

Students, faculty, or other members of the university community who violate these regulations will be subject to disciplinary action; violators also jeopardize their right to remain in the university community.

DEPARTMENTAL JURISDICTION
Certain departments of the university shall have the power to set down rules and regulations governing the operation of the departments' respective areas of responsibility. Such rules and regulations shall be in accord with the "General Statement of Student Rights and Responsibilities" as well as with the policies pertaining to student conduct as defined in this document.

DISMISSAL FROM CLASS
Students dismissed from classes for insubordination or other disciplinary reasons may not return without the approval of the college and the vice president for student affairs.

IDENTIFICATION CARDS
All students must have in their possession at all times the officially approved and properly validated photo identification card. It will be necessary to show this card as a means of identification when using the library and campus recreational facilities, at athletic contests, at student elections, at University Health and Counseling Services, at Student Accounts, at the Office of the Registrar, to campus police, and elsewhere around the university. All members of the community should be prepared and willing to identify themselves and their guests upon request by authorized personnel. An official photo identification card will be issued to new students during their initial orientation and registration periods. Replacements for lost cards can be obtained at the Office of the Registrar, 271 Huntington Avenue.

JURY DUTY
Northeastern expects students to fulfill their civic duties; the university cannot interfere in this process. Students who miss classes because of this obligation must notify their professors in writing, explaining which classes will be missed on which days. The professors will work with students to make up missed assignments or exams. Upon completion of their jury duty, students must bring a copy of the documentation of their service to the appropriate professors. Students on co-op are expected to inform their supervisors if called to jury duty.

MEDIA AND PUBLIC APPEARANCES
In all personal communications to newspapers or other media, as well as personal public appearances in which students identify themselves as members of the Northeastern University community, it should be made clear that the opinions presented are a student's own and not necessarily those of the university. Students who appear on public programs as representatives of Northeastern University must be particularly careful to avoid language or presentations that could be considered in bad taste or offensive.

PETS
Pets are prohibited in all university buildings out of consideration for the general community and to maintain a clean and healthy environment. Exceptions are made for guide dogs and other guide animals.

PUBLIC ACCESS
Access by the general public to attend special programs or functions is limited to those events approved for such attendance. The facilities of the university were designed for the use of members of this academic community. When appropriate, access may be permitted for events and programs when it is apparent that the students, faculty, staff, and alumni of the university and their guests will not fill the facility reserved for such use. In such cases, special provisions must be made to ensure that members of this academic community have priority to attend and are not precluded from attendance by the general public. Certain facilities, such as residence halls, classrooms, and laboratories, are designed for and are to be used by residence hall residents only, or in the case of classrooms and laboratories, by members of this academic community. In all cases, the essential educational purpose of the university cannot be interrupted or disturbed by the access of the general public. Officials of the university may restrict or prevent access by the public if such access disturbs or has the potential to disturb classes or other functions of Northeastern University. Occasionally, access to an area such as the Krentzman Quad will be granted to distribute free literature or provide a public forum for speakers. Such use requires the prior approval of the director of student activities and will be granted only during the Wednesday and Thursday activity periods. The use of facilities such as residence halls or cafeterias for distribution of literature or for speakers is prohibited.

SAFETY GLASSES
Safety glasses must be worn in all chemistry laboratories and other facilities as required.

SALES AND SOLICITATIONS
Northeastern University is not a marketplace. Sales of material or solicitations, such as newspapers and other printed matter, insurance, foodstuffs, and all other articles are prohibited without the express written permission of designated officials of the university. Solicitations of any kind are also prohibited without the express written permission of designated officials. Exceptions to this policy are made for recognized student organizations and residence hall residents. Residence hall residents should request permission to sell within their housing unit from the director of residential life; recognized student organizations should request permission for sales from the director of student activities; all others should apply to the business manager of the university. Such permission, when granted, is for designated areas within the university and is subject to the restrictions imposed by the approving officials. General solicitation, especially in such areas as classrooms, lounges, and cafeterias, is not permitted.

SMOKING
All university administrative and classroom buildings are smoke free and tobacco free. The policy relates to all campuses. The only university facilities not covered by this policy are residence halls and apartment buildings. The sale of cigarettes and other tobacco products is prohibited on campus. Smoking cessation information and programs are available. For further information, contact the Office of Human Resources Management or University Health and Counseling Services.

TAPE RECORDERS
Students may not use tape recorders in the classroom without the instructor's consent. Students with disabilities who need a tape recorder in the classroom may make arrangements through the Disability Resource Center, 20 Dodge Hall.

TEXTBOOKS
Students should purchase or have in their possession the assigned textbooks, problem books, manuals, and other supplies that may be necessary in a classroom or laboratory.

Students' Bill of Academic Rights and Responsibilities

This bill was drafted by the Student Senate, the vice president for student affairs, and members of the Faculty Senate. It was passed in the spring of 1992.

Academic Rights
We, the students of Northeastern University, believe that a quality education is the paramount goal of all students. In order to fulfill this goal, the university must recognize certain rights, which are set down in this document. (The student rights, through their representatives in the Student Government Association [SGA], described in these sections arise from faculty and staff employment responsibilities and obligations to the university. Northeastern University students recognize

and accept that it is the sole prerogative of the university to enforce these obligations and responsibilities and to determine whether and to what extent they are being carried out or violated in specific instances. Northeastern University students recognize and accept that their ability to effect redress of complaints arising from these rights is limited to the procedures specified in "Appeals Policies and Procedures."

COURSE-RELATED RIGHTS

Article 1 Students have the right to instructors who attend scheduled classes on time.

Article 2 Students have the right to view work they submit to satisfy course requirements after it is graded.

Article 3 Students have the right to adequate access to instructors.

Article 4 Students have the right to receive a course outline, which includes a fair and explicit grading policy, at the beginning of each course.

Article 5 Students have the right to instructors who communicate the material pertaining to the course effectively in the English language, except in the case of foreign language instruction.

Article 6 Students have the right to participate in and have access to Student Government Association student teacher course evaluations.

RIGHTS TO UNIVERSITY ACADEMIC SERVICES

Article 7 Students have the right to adequate access to effective academic services, as described in the student handbook and other university publications, provided by the university.

Article 8 Students have the right to an environment conducive to learning. (Because the university operates on a 12-month calendar in an urban environment, many construction, remodeling, renovation, and repair projects must take place while the university is in session and while other potential distractions from the learning process arise from the surrounding urban environment on which it is dependent but over which it exerts little or no control. Thus, though the university is committed to maintaining an appropriate learning environment for its students, Northeastern University students recognize and accept, as part of their relationship with the university, that the conditions described above may cause occasional disturbances to that environment. The articles shall be interpreted by the Office of the Provost in conjunction with the Office of the Vice President for Student Affairs, and shall be monitored by the Student Government Association. Further, should any student discover that he or she has been subject to any violation of the principles stated herein, the student should follow the appropriate complaint resolution procedure in "Appeals Policies and Procedures (p. 31)." The Student Government Association, if requested by the student, will monitor the progress of any student academic grievances.)

Article 9 Disabled students have the right to be treated in a nondiscriminatory fashion in accordance with the policies described in university publications and consonant state and federal laws.

SCHEDULING RIGHTS

Article 10 Students have the right to nonconflicting final exam schedules.

Article 11 Students have the right to final exam schedules in accordance with established university policy.

Article 12 Students have the right to be excused from academic commitments for a religious observance.

GENERAL ACADEMIC RIGHTS

Article 13 Students have the right to be informed, in a timely fashion, of proposed or actual university action to be taken against them.

Article 14 Students have the right of access to their academic and financial aid records and maintenance of the privacy of these records, as provided by the Federal Educational Rights and Privacy Act.

Article 15 Students have the right to be free from harassment by other members of the university community.

Article 16 Students have the right to the redress of academic grievances.

Student Responsibilities

It is each student's responsibility to:

1. Contribute to a climate of open inquiry and honesty in all aspects of the university's academic life.
2. Commit sufficient time and effort for study and the use of library, studio, and computational facilities in connection with each course.
3. Contribute to the classroom/laboratory/studio learning environment through discussion and active participation.
4. Acquire the necessary prerequisites for full participation in each academic course.
5. Attend scheduled classes regularly and on time.
6. Obtain help with problems encountered in a given course by seeking out faculty and teaching assistants outside class time.
7. Respect the concept of academic freedom of each faculty member.
8. Assist the university in its self-evaluation by responding honestly and conscientiously.

College of Arts, Media and Design

Website (http://www.northeastern.edu/camd)

Elizabeth Hudson, PhD, Dean

Alan J. Zaremba, PhD, Associate Dean for Undergraduate Programs
Jane Amidon, MLA, Associate Dean for Graduate Programs and Research
Hilary Poriss, PhD, Associate Dean for Academic and Faculty Affairs
Thomas Michael, MBA, Associate Dean for Administration and Finance

Graduate Enrollment and Student Services
100 Meserve Hall
617.373.5329 or 617.373.2566
gradcamd@northeastern.edu

The College of Arts, Media and Design (CAMD) offers graduate programs that build on existing knowledge and establish innovative areas of inquiry and practice. We work with students to frame, research, and answer transformative questions. Together, we challenge, engage, and shape global cultures and marketplaces.

Our Mission

We create a distinctive experiential education by leveraging emergent practices and scholarship in the arts, media, and design. Our unique combination of disciplines empowers innovative thinking and making. Our students become informed citizens and creative leaders with an entrepreneurial spirit.

Graduate Studies in the College of Arts, Media and Design

Welcome to graduate studies at CAMD. This is an exciting time to pursue advanced education and scholarship in creative fields. Never have the arts and culture been so clearly essential to our social, economic, and environmental future. From artist outreach in underserved communities to "serious" game design for health and security; from green building innovation to sustainable urban design; from international entertainment and media to provocative performances in "found spaces"; from incisive data visualization that changes how we view the world to cutting-edge journalism—our faculty and students are involved in a wealth of academic experiences, creative enterprises, and professional endeavors.

At CAMD, we take our mission and vision very seriously. We deliver an outstanding graduate education in traditional areas while exploring new approaches to this generation's transformative questions. The "space between our disciplines" is intellectually rich, educationally vibrant, and professionally productive. Our interdisciplinary degree options provide a strong foundation of use-inspired, experientially informed course work and research opportunities. Our programs are designed to produce graduates equipped to engage the international marketplace and shape global culture.

Take a moment to introduce yourself to the faculty and graduate coordinators in your field of interest. Become familiar with the many events offered across CAMD and the campus. Stop by CAMD's graduate programs website (http://www.northeastern.edu/camd/academics/graduate) often , where you'll find current news and links to services such as the registrar's office. Familiarize yourself with the university's graduate school website (http://www.northeastern.edu/graduate) to explore numerous links to graduate resources, policies, and student organizations.

We look forward to getting to know you and to incorporating your individual education and career interests into the graduate community of CAMD.

Academic Policies and Procedures

General Information

Five units in the College of Arts, Media and Design offer programs at the graduate level:

- Architecture
- Art + Design
- Game Design
- Journalism
- Music

Master's Degree Policies

The College of Arts, Media and Design (CAMD) graduate studies sets minimum standards for all students to fulfill. In addition, departments and programs may have requirements that exceed the standards outlined below. Finally, the CAMD Graduate Programs General Regulations booklet (found at the college's webpage (https://camd.northeastern.edu/academics/graduate/current-students)) further summarizes the expectations for student conduct, academic life, and the responsibilities of the students and the college to one another.

A candidate for the master's degree must complete a minimum of 30 semester hours of graduate-level course work and such other study as may be required by the department in which the student is registered. To qualify for the degree, a minimum cumulative grade-point average (GPA) of 3.000, equivalent to a grade of B, must be obtained. This average will be calculated each semester. A student who does not make satisfactory progress toward degree requirements, as specified by the individual department, may be terminated from the program.

To maintain current student status within CAMD, graduate students must make satisfactory progress in their degree, including working toward the graduation requirement of a GPA of 3.000 and the timely completion of course work. See the university's policy on academic standing ("Minimum Cumulative Grade-Point Average (p. 27)").

All students must be registered in the last semester of their program. Any student who does not attend Northeastern University for a period of one year will be required to apply for readmission.

Electives

No more than 8 credit hours (6 credit hours for students in the music industry leadership program) of electives may be taken outside of CAMD. Any additional non–CAMD elective hours will not count toward the degree.

Student Aid Awards

Only those students who are registered in degree programs are eligible for awards. Award recipients will receive an official award letter from CAMD graduate studies. Pay attention to this letter as it is an official contract that should be read carefully. Graduate Student Scholarships (GSS) are contingent on satisfactory academic progress toward the degree and meeting department-specific guidelines. Recipients must be in full-time status and be registered for a minimum of 8 semester hours. Receipt of financial support administered by CAMD graduate studies requires that all students receiving awards must maintain a 3.000 cumulative GPA. Students whose cumulative GPA is below 3.000 will be placed on academic probationary status and are not eligible to receive the award while on probation. The GSS can be reactivated by raising the cumulative GPA to 3.000 in the subsequent semester; students who do not meet the minimum GPA requirement at the end of the next semester cannot receive additional probationary periods.

Leave of Absence

Full-time students who are not involved in any academic endeavor for a period of time are required to petition the manager of student services, through their department, for a leave of absence by completing the leave of absence petition through the myNEU web portal. CAMD graduate studies will not accept retroactive leave requests. Note that if a student is requesting a leave for medical reasons, students should contact University Health and Counseling Services (http://www.northeastern.edu/uhcs/forms) at 617.373.2772. Leaves of absence generally are not approved for more than one calendar year at a time. International students should consult with an advisor at the Office of Global Services (https://www.northeastern.edu/ogs) for proper guidance. Leaves of absence are not appropriate for master's degree students who are working on a thesis but are away from the Northeastern campus. Except in the case of medical leaves, being on an approved leave of absence does not extend the amount of time allowed for degree completion or the makeup of incomplete grades.

Time Limitation

For the master's degree, course credits earned in the program of graduate study are valid for a maximum of seven years.

If students wish to apply for an extension of the time limit, they must submit a petition to their department of study. The petition must include a detailed plan for completion of all remaining degree requirements. In the case of time-limit extension requests for master's degree course work, the department must certify that the content of each of the courses has not changed since the time the student completed the course. If deemed appropriate, the department will recommend approval of the extension to CAMD graduate studies.

Changes in Requirements

The continuing development of CAMD graduate studies forces regular revision of curricula. When no hardship is imposed on the student because of changes and the facilities of the school permit, the student is expected to meet the most recent requirements. However, if it can be demonstrated that doing so imposes a substantial hardship, the requirements of the year in which the student matriculated will be applicable.

Thesis

Theses are required in some programs and should demonstrate the individual's capacity to execute independent work based on original material. Registration for the thesis is required. Theses must be approved by the departmental graduate committee and must receive a grade of B (3.000) or better to be accepted. Students who have not completed their thesis after having registered for the specified number of thesis credits must register and pay for Thesis Continuation.

Graduate Student Classification

Regular Student

Those students who are admitted to a degree program.

Conditional Student

Students whose admissions files are missing documentation. Conditional students must submit the requested documentation, to the satisfaction of College of Arts, Media and Design (CAMD) graduate studies, no later than the completion of their first month of study. Once the documentation has been submitted, the student's status will be reevaluated.

Provisional Student

Students whose academic records do not qualify them for acceptance as regular students. Provisional students must obtain a B (3.000) average in the first 9 semester hours of study or meet specifically delineated departmental requirements to qualify for full acceptance to a degree program. Provisional students are not eligible for awards or financial aid.

Special Student

Special students are enrolled on a part-time basis (no more than 6 semester hours per semester). Credit can be earned for a maximum of 9 semester hours over time. Students interested in taking more than 9 semester hours must make a formal application to the degree program. Use the Internal Admission Application Notification form (https://camd.northeastern.edu/academics/graduate/current-students). Special students who do not register for four consecutive semesters (excluding summer semester) will be subject to review and possible withdrawal by CAMD graduate studies.

School of Architecture

Website (http://www.northeastern.edu/camd/architecture/academics/graduate)

Lucy Maulsby, PhD
Associate Professor and Interim Director
l.maulsby@northeastern.edu

151 Ryder Hall
617-373-4637

Peter H. Wiederspahn, M.Arch
Associate Professor/ Graduate Coordinator
RY383 /617.373.4538
p.wiederspahn@northeastern.edu

Master of Architecture

Northeastern offers a Master of Architecture degree accredited by the National Architectural Accreditation Board. The graduate coordinator for the school is Peter Wiederspahn. He also oversees the MArch program. Professor Jane Amidon is the coordinator of the MDES-SUEN program.

The program leverages the school's outstanding faculty and pragmatically grounded curriculum. The physical and cultural context of Boston serves as a laboratory for the program's design studios and is design focused but with a different approach than many schools. We find opportunities for innovation within the real estate and construction industries and current policy debates—rather than outside them. This is

how we intend to move architects to the center of the discussion about the future of our cities.

Students take courses in urban housing, practice-integrated design, and do original research on market-driven building types. The final degree project in the design studio offers an opportunity to leverage this research with real innovations in hybrid types, strategic alterations to existing ones, and to take on the challenge of finding prototypical solutions for systemic problems.

In addition to studio courses, graduate students take seminars in architectural theory and design strategy; and electives are available in real estate development, sustainable building techniques, urban landscape, and other topics. There is also a unique course that looks at case studies of architecture firms in practice, problem solving, and innovation. We seek to have students leave our program with a unique balance of technical, theoretical, and strategic tools to make a real difference in the profession.

Master of Design for Sustainable Urban Environments

The Master of Design for Sustainable Urban Environments (MDes-SUEN) brings together the allied professional fields of environmental design, landscape architecture, and urban planning to offer advanced study and research opportunities in the design of ecologically and economically productive urban environments. The program seeks to supply graduates for the rapidly growing field of sustainable urbanism through a dynamic curricular mix of design, dialogue, and technical courses, enriched by diverse interdisciplinary electives.

The pedagogic and research focus of the MDes is the design, implementation, and management of sustainable urban environments from the scale of individual parcels to regional systems. Key topics include brownfield and waterfront revitalization, sustainable and secure pedestrian environments, urban habitat design and management, and green and blue infrastructure design and planning with an emphasis handling increased storm water and tidal influx in the urban landscape.

The MDes is a unique program of study in which urban landscape design, planning, and policy dovetail with environmental engineering, environmental science, art, and visualization. Boston's history of innovation in environmental design as well as its legacy of urban redevelopment provide a rich backdrop and laboratory of urban, infrastructural, and ecological prototypes that ideally position the program to creatively and critically explore local issues with global implications.

Contemporary urban theory includes a significant body of writing in the area of "Landscape-" and "Ecological-Urbanism," a critical discourse that looks at the full range of environmental strategies for urban sites with an emphasis on ecological thinking. The paradigm of sustainable environmental design is moving away from form-based planning toward dynamic ecosystem services. This program seeks to prepare students to be innovative and entrepreneurial designers able to combine economic, environmental, and social priorities to make next-generation public spaces and systems.

Programs

Master of Architecture (MArch)

- One-Year Program (p. 43)
- Two-Year Program (p. 44)
- Three-Year Program (p. 44)
- Three-Year Program—Advanced Degree Entrance (p. 46)

Master of Design for Sustainable Urban Environments (MDes-SUEN)

- One-Year Program (p. 47)
- Two-Year Program (p. 47)

Master of Architecture—One-Year Program

This program gives eligible candidates the opportunity to get a NAAB-accredited Master of Architecture degree in one year.

Open to candidates with either a Bachelor of Science in Architecture from Northeastern University or a professional Bachelor of Architecture degree from an accredited North American program with at least one year of IDP-approved professional experience.

Students engage in a two-semester research and design project based on pertinent contemporary topics chosen by the graduate faculty, or students may propose an independent research and design project. Team research is conducted and compiled into online and physical research books. This body of compiled research then becomes the basis of the intellectual framework for the individual students' design projects. This final degree project parallels an in-depth two-semester professional practice sequence that analyzes all of the contingencies of successful architectural projects, including architectural offices and their project management strategies, real estate development criteria, and associated project finance.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Program Requirements

Semester 1		
ARCH 6330	Seminar in Modern Architecture	4
ARCH 6430	Case Studies 1	4
ARCH 7130	Master's Research Studio	6
Semester 2		
ARCH 6340	Graduate Topics in Architecture	4
ARCH 6440	Case Studies 2	4
ARCH 7140	Master's Degree Project	6
Elective		
Students must complete a 4-semester-hour graduate elective.		4

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ARCH 6330	4	ARCH 6340	4	Vacation	0	Vacation	0
ARCH 6430	4	ARCH 6440	4				
ARCH 7130	6	ARCH 7140	6				
Elective	4						
	18		14		0		0

Total Hours: 32

Master of Architecture—Two-Year Program

This program offers students who have earned a Bachelor of Science in Architecture from an institution other than Northeastern to engage in the urban-focused curriculum that is offered at the School of Architecture.

YEAR ONE

Students in their first semester have the option to either study in our Berlin program in Germany or study in Boston. Both the Berlin Design Studio and Boston Option Design Studio focus on urban housing and its aggregation. Students have the opportunity to learn and develop new patterns of housing specifically for those cities with their individual design interventions. The Comprehensive Design Studio in the second semester challenges the students to consider architectural connections at all scales, from architectural detail, to architectural systems, to the whole building and its urban context.

YEAR TWO

In the final year, students engage in a two-semester research and design project based on pertinent contemporary topics chosen by the graduate faculty, or students may propose an independent research and design project. Team research is conducted and compiled into online and physical research books. This body of compiled research then becomes the basis of the intellectual framework for the individual students' design projects. This final degree project parallels an in-depth two-semester professional practice sequence that analyzes all of the contingencies of successful architectural projects, including architectural offices and their project management strategies, real estate development criteria, and associated project finance.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Studio		
ARCH 5115	Option Studio	6
ARCH 5120	Comprehensive Design Studio	6
ARCH 7130	Master's Research Studio	6
Case Study		
ARCH 6430	Case Studies 1	4
ARCH 6440	Case Studies 2	4
Building and Environment		
ARCH 5210	Environmental Systems	4
ARCH 5220	Integrated Building Systems	4
Topics and Seminar		
ARCH 5310	Design Tactics and Operations	4
ARCH 6330	Seminar in Modern Architecture	4
ARCH 6340	Graduate Topics in Architecture	4

Research Project

ARCH 7140	Master's Degree Project	6

Electives

Complete 8–16 semester hours (5000 level or above) from outside the following subject area:	8-16
ARCH	

Program Credit/GPA Requirements

60–68 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ARCH 5115	6	ARCH 5120	6	Vacation	0	Vacation	0
ARCH 315		ARCH 5210 (and)	4				
Elective (Required/ or)	4	ARCH 5211					
ARCH 336		ARCH 5220	4				
ARCH 5310 (or)	4	Elective (Optional)	4				
ARCH 336							
Elective (Required/ or)	4						
GRMN 110							
	18		18		0		0

Year 2

Fall	Hours	Spring	Hours
ARCH 6330	4	ARCH 6340	4
ARCH 6430	4	ARCH 6440	4
ARCH 7130	6	ARCH 7140	6
Elective (optional)	4		
	18		14

Total Hours: 68

*Berlin curriculum

Master of Architecture—Three-Year Program

Open to candidates who do not have a Bachelor of Science in Architecture or equivalent.
Applicants from all disciplines are welcome. Those who have some architecture course work may be eligible for advanced placement.

The program requires three years of study. Students have the option to spend a semester at the school's Berlin program and have the option to enroll in the summer intern program managed by the university's co-op program.

After completing a first-year introductory curriculum, students in the three-year program merge into the two-year MArch curriculum.

YEAR ONE

In the first year, students take intensive studios, technology classes, and architectural history classes to immerse them in the studio culture of the school and to give them a strong foundation to begin the upper-level studios. The introductory graduate skills and design studios are specifically designed for the students in this program who do not have experience doing architectural drawing and designing. Students complete a series of projects that will give them an opportunity to develop the skills and the critical thinking needed in the graduate curriculum.

YEAR TWO

Students in their second year have the option to either study in our Berlin program in Germany or study in Boston. Both the Berlin Design Studio and Boston Option Design Studio focus on urban housing and its aggregation. Students have the opportunity to learn and develop new patterns of housing specifically for those cities with their individual design interventions. The Comprehensive Design Studio in the second semester challenges the students to consider architectural connections at all scales, from architectural detail, to architectural systems, to the whole building and its urban context.

YEAR THREE

In the final year, students engage in a two-semester research and design project based on pertinent contemporary topics chosen by the graduate faculty, or students may propose an independent research and design project. Team research is conducted and compiled into online and physical research books. This body of compiled research then becomes the basis of the intellectual framework for the individual students' design projects. This final degree project parallels an in-depth two-semester professional practice sequence that analyzes all of the contingencies of successful architectural projects, including architectural offices and their project management strategies, real estate development criteria, and associated project finance.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

- Students in the Boston option should complete Design Tactics and Operations (ARCH 5310), Option Studio (ARCH 5115), and Structural Systems (ARCH 5230).
- Students in the Berlin option should complete Architecture and Urbanism Abroad (ARCH 3361), Studio Abroad (ARCH 3155), and Seminar Abroad (ARCH 3362)

General Requirements

History		
ARCH 2330	Architecture, Modernity, and the City, 1800 to 1910	4
ARCH 2340	Architecture, Modernity, and the City, 1910 to 1980	4
Building, Design, and Environment		
ARCH 5230	Structural Systems	4
or ARCH 3362	Seminar Abroad	
ARCH 2240	Architectonic Systems	4
ARCH 3450	Advanced Architectural Communication	4
ARCH 5210	Environmental Systems	4
ARCH 5220	Integrated Building Systems	4
Studio		
ARCH 5115	Option Studio	6
or ARCH 3155	Studio Abroad	
ARCH 5120	Comprehensive Design Studio	6
ARCH 6100	Graduate Skills Studio	6
ARCH 6200	Graduate Studio 1: Architectural Design	6
ARCH 7130	Master's Research Studio	6
Professional Practice		
ARCH 6430	Case Studies 1	4
ARCH 6440	Case Studies 2	4
Topics and Seminar		
ARCH 5310	Design Tactics and Operations	4
or ARCH 3361	Architecture and Urbanism Abroad	
ARCH 6330	Seminar in Modern Architecture	4
Complete the following (repeatable) course twice:		8
ARCH 6340	Graduate Topics in Architecture	

Research Project

ARCH 7140	Master's Degree Project	6

Electives

Required Electives	
Complete 8 semester hours of non-ARCH courses (required).	8
Optional Electives	
Complete 4 semester hours of ARCH courses (optional). Electives outside architecture may be taken in consultation with your faculty advisor.	

Program Credit/GPA Requirements

96–104 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours
ARCH 2330 (and)	4	ARCH 2340 (and)	4	Vacation	0
ARCH 223		ARCH 234			
ARCH 6100	6	ARCH 5210 (and)	4		
ARCH 2240	4	ARCH 521			
ARCH 2230 or Elective (Required)*	4	ARCH 6200	6		
		Elective (Required)	4		
	18		18		0

Year 2

Fall	Hours	Spring	Hours
ARCH 2230 (or)	4	ARCH 3450	4
ARCH 336		ARCH 5120	6
ARCH 5115	6	ARCH 5220	4
ARCH 315		ARCH 6340 (1 of 2)	4
ARCH 5310 (or)	4		
ARCH 336			
Elective (Optional or)	4		
GRMN 11(			
	18		18

Year 3

Fall	Hours	Spring	Hours
ARCH 6330	4	ARCH 6340 (2 of 2)	4
ARCH 6430	4	ARCH 6440	4
ARCH 7130	6	ARCH 7140	6

Elective (Optional)	4	
	18	14

Total Hours: 104

** Take Arch 2230 in Fall Year 1 if planning on Berlin program in Fall Year 2.*

*** Berlin curriculum*

Master of Architecture—Three-Year Program—Advanced Degree Entrance

Open to candidates who do not have a Bachelor of Science in Architecture or an equivalent degree. Students with some background in architecture may be eligible for advanced placement into the program. Advanced placement will be determined by an applicant's transcript and portfolio.

Only select courses in the first year of the program will be waived. All waivers are at the discretion of the school and applicants may be required to provide documentation if they seek additional waivers (78–100 credits total based on waivers).

The minimum course work for all students in the first year of the program is:

- Two studio courses (minimum 10 credits total)
- Two graduate electives (minimum 8 credits total)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

All advanced-entry students must complete a minimum of 10 semester hours per semester in the first year. Course waivers are determined by the faculty and students should consult with their advisor.

Prerequisites

Courses listed below may be waived as determined by faculty advisor.

History		
ARCH 2330	Architecture, Modernity, and the City, 1800 to 1910	4
ARCH 2340	Architecture, Modernity, and the City, 1910 to 1980	4
Building, Design, and Environment		
ARCH 5230	Structural Systems	4
or ARCH 3362	Seminar Abroad	
ARCH 2240	Architectonic Systems	4
Studio		
ARCH 6100	Graduate Skills Studio	6

General Requirements

Studio		
ARCH 5110	Housing and Aggregation	6
or ARCH 3155	Studio Abroad	
ARCH 5120	Comprehensive Design Studio	6
ARCH 6200	Graduate Studio 1: Architectural Design	6
ARCH 7130	Master's Research Studio	6
Professional Practice		
ARCH 6430	Case Studies 1	4
ARCH 6440	Case Studies 2	4
Building, Design, and Environment		
ARCH 3450	Advanced Architectural Communication	4
ARCH 5210	Environmental Systems	4
ARCH 5220	Integrated Building Systems	4
Topics and Seminar		
ARCH 5310	Design Tactics and Operations	4
or ARCH 3361	Architecture and Urbanism Abroad	
ARCH 6330	Seminar in Modern Architecture	4
Complete the following (repeatable) course twice:		8
ARCH 6340	Graduate Topics in Architecture	

Research Project

ARCH 7140	Master's Degree Project	6

Electives

Required Electives	
Complete 8 semester hours of non-ARCH courses.	8
Additional Elective or Topics	
Complete 8 semester hours of non-ARCH courses.	8

Program Credit/GPA Requirements

78–104 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours
ARCH 2330 (and)	4	ARCH 2340 (and)	4
ARCH 2331		ARCH 2341	
ARCH 2240	4	ARCH 5210 (and)	4
ARCH 6100	6	ARCH 5211	
ARCH 2230 (or)*	4	ARCH 6200	6
Elective (required)		Elective (required)	4
	18		18

Year 2

Fall	Hours	Spring	Hours
ARCH 2230 (and ARCH 2231 or)	4	ARCH 3450	4
ARCH 3362**		ARCH 5120	6
ARCH 5110 (or)	6	ARCH 5220	4
ARCH 3155**		ARCH 6340 (1 of 2)	4
ARCH 5310	4		
ARCH 3361**			
Elective (optional or)	4		
GRMN 1101**			
	18		18

Year 3

Fall	Hours	Spring	Hours
ARCH 6430	4	ARCH 6340 (2 of 2)	4
ARCH 6330	4	ARCH 6440	4

ARCH 7130	6	ARCH 7140	6
Elective (optional)	4		
	18		14

Total Hours: 104

Note: Only courses in year 1 may be waived. Course waivers at discretion of program director.

** Take Arch 2230 in Fall Year 1 if planning on Berlin program in Fall Year 2.*

*** Berlin curriculum*

Master of Design for Sustainable Urban Environments—One-Year Program

The one-year Master of Design for Sustainable Urban Environments (MDes-SUEN) is open to students holding an accredited, first-professional degree in landscape architecture, architecture, planning, or urban design. The 36-credit program offers a core sequence of advanced design research studios, proseminars, and urban ecology and technology workshops complemented by interdisciplinary electives.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Studio		
SUEN 7130	Master's Research Studio: Design and the Resilient City	6
SUEN 7140	Master's Research Studio: Master's Project	6
Proseminar		
Complete 8 semester hours from the following (repeatable) courses:		8
SUEN 7320	Pro-Seminar: Issues in Designed Urban Environments	
SUEN 6340	Topics in Urban Environmental Design	
Technology		
SUEN 7230	Urban Ecologies and Technologies 1	4
SUEN 7240	Urban Ecologies and Technologies 2	4

Electives

Electives in other disciplines may be taken in consultation with your faculty advisor.

Complete 8 semester hours from the following subject areas:	8
SUEN, ARCH, LARC, PPUA, LPSC, and SBSY	

Program Credit/GPA Requirements

36 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours
SUEN 7130	6	SUEN 7140 (or co-op*)	6
SUEN 7230	4	SUEN 7240	4
SUEN 7320	4	SUEN 7320 (or)	4
Elective	4	SUEN 6340	
		Elective	4
	18		18

Total Hours: 36

*Students may opt to do a full- or part-time graduate co-op. Co-op does not count toward degree credits.

Master of Design for Sustainable Urban Environments—Two-Year Program

The two-year Master of Design for Sustainable Urban Environments (MDes-SUEN) is open to students entering with a bachelor's degree in any field. The 64-credit program provides a full year of core skill sets including design; site analysis, implementation, and visualization; history/theory; and policy. This includes introduction to basic earthworks, water, and plants systems as well as the principles of landscape and urban ecology.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Studio		
SUEN 6110	Graduate Studio 1: Sustainable Urban Sites	6
SUEN 6120	Graduate Studio 2: Sustainable Urban Systems	6
SUEN 7130	Master's Research Studio: Design and the Resilient City	6
SUEN 7140	Master's Research Studio: Master's Project	6
Cities: Design and Planning		
SUEN 6310	Cities, Nature, and Design in Contemporary History and Theory	4
LPSC 7312	Cities, Sustainability, and Climate Change	3
LPSC 8400	Planning Module in Urban Law and Policy	1
Proseminar		
Complete 8 semester hours from the following (repeatable) courses:		8
SUEN 7320	Pro-Seminar: Issues in Designed Urban Environments	
SUEN 6340	Topics in Urban Environmental Design	
Technology		
SUEN 6210	Implementation and Visualization for Urban Environments 1	4
SUEN 6220	Implementation and Visualization for Urban Environments 2	4
SUEN 7230	Urban Ecologies and Technologies 1	4
SUEN 7240	Urban Ecologies and Technologies 2	4

Electives

Electives in other disciplines may be taken in consultation with your faculty advisor.

Complete 8 semester hours from the following subject areas:	8
SUEN, ARCH, LARC, PPUA, LPSC, SBSY	

Program Credit/GPA Requirements

64 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
SUEN 6110	6	SUEN 6120	6	Vacation	0	Vacation	0
SUEN 6210	4	SUEN 6220	4				
SUEN 6310	4	LPSC 7312 (and)	3				
Elective (optional)	4	LPSC 8400	1				
		Elective (optional)	4				
	18		18		0		0

Year 2

Fall	Hours	Spring	Hours
SUEN 7130	6	SUEN 7140 (or co-op)*	6
SUEN 7320	4	SUEN 7320 (or)	4
SUEN 7230	4	SUEN 6340	
Elective	4	SUEN 7240	4
		Elective	4
	18		18

Total Hours: 72

Note: Students may opt to do a full- or part-time graduate co-op. Co-op does not count toward degree credits.

Art + Design

Website (http://www.northeastern.edu/camd/artdesign/academics/graduate)

Tad Hirsch, PhD
Chair

239 Ryder Hall
617.373.2347
Dara-Lynn Pelechatz, Administrative Officer,
D.Pelechatz@northeastern.edu

Graduate Program Coordinators

Dietmar Offenhuber, PhD
Assistant Professor and Information Design and Visualization Graduate Coordinator
311 Ryder Hall
617.373.3378
www.northeastern.edu/visualization (http://www.northeastern.edu/visualization)

Casper Harteveld, PhD
Assistant Professor and Game Science and Design and Game Analytics Graduate Coordinator
140 Meserve Hall
617.373.4027
www.northeastern.edu/camd/gamedesign (https://camd.northeastern.edu/gamedesign)

Sarah Kanouse, MFA
Associate Professor and Interdisciplinary Arts Graduate Coordinator
319 Ryder Hall
617.373.6371
camd.northeastern.edu/artdesign/academic-programs/mfa-interdisciplinary-arts/ (https://camd.northeastern.edu/artdesign/academic-programs/mfa-interdisciplinary-arts)

Kristian Kloeckl, PhD
Associate Professor and Experience Design Graduate Coordinator
448D Ryder Hall
617.373.6987
camd.northeastern.edu/artdesign/academic-programs/experience-design/ (https://camd.northeastern.edu/artdesign/academic-programs/experience-design)

Mira Cantor, MFA
Professor and Studio Art (SMFA) Graduate Coordinator
313 Ryder Hall
617.373.2348

The graduate programs in the Department of Art + Design are designed to cultivate capacity and fluency in a range of disciplines and practices to create and deliver value and benefit for an increasingly connected and diverse world. Spanning many subjects, interests, and intentions across disparate fields and manifold practices of art, media, and design, our master's and certificate programs will challenge and inspire you to push the boundaries of cultural production and stewardship and social and civic impact. We strive to empower you to bring your ideas to life through design conversations, media making, and artistic expression and enjoy richly rewarding careers and lives.

Programs

Master of Fine Arts (MFA)

- Experience Design (p. 48)
- Information Design and Visualization (p. 49)
- Interdisciplinary Arts (p. 50)

Master of Science (MS)

- Experience Design (p. 51)

Graduate Certificate

- Arts Administration and Cultural Entrepreneurship (p. 52)
- Cultural Entrepreneurship (p. 52)
- Experience Design (p. 53)
- Information Design and Visualization (p. 54)

Experience Design, MFA

The Master of Fine Arts in Experience Design embraces research-driven design thinking for entrepreneurship, innovation, and other areas, preparing students to be vital contributors and leaders at the intersection of innovation and design.

Experience design is a holistic and integrative approach to design that utilizes investigation into the human experience in specific situations to improve its quality, given an understanding of human goals, needs, and desires. For example, in the context of healthcare, an experience

designer does not focus on the design of any one technology product, information system, or physical space. Instead, the designer is charged with understanding and improving the overall sequence of events that impact the patient before and during a hospital stay as well as through follow-up care.

The experience design program moves beyond design thinking to produce outcomes that demonstrate the value of human-centered research and design methods. It draws on findings from a range of professional and scholarly disciplines (including business, psychology, human-computer interaction, engineering, cybernetics) to understand and shape specific situations. It extends across many industries and aspects of life: healthcare, technology, services, travel, education, entertainment, shopping, dining, and the nature of work itself.

Through examining how people behave in a *real* context in relation to emerging technologies, the Master of Fine Arts in Experience Design allows graduates from design and related disciplines (such as communications, computer science, business, architecture, art, journalism, humanities, and the social sciences) to gain knowledge and experience in the design competencies. To accomplish these goals, students will learn how to invoke cooperation, collaboration, and integration across disciplines and practices.

The Master of Fine Arts in Experience Design seeks to prepare students to be vital contributors and leaders of professional experience design teams where technological innovation intersects with design. Successful graduates will be able to analyze how people undergo real-world situations, enabling them to enrich experience by orchestrating new design-driven relationships. They will be equipped with the skills to identify shortcomings as well as opportunities for improved engagement between systems and elements—virtual or physical—with the humans who encounter them.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
ARTG 5600	Experience Design Studio 1—Principles	4
ARTG 5610	Design Systems	4
ARTG 5620	Notational Systems for Experience	4
ARTG 5630		4
ARTG 5640		4
ARTG 6310	Design for Behavior and Experience	4
ARTG 6600		4
ARTG 6700		4
Thesis		
ARTG 7600		4
ARTG 7990	Thesis	4
ARTG 7991		4
Open Electives		
Complete courses from the following list:		16
ARTD 5001	Art, Context, Action 1	
ARTG 5310	Visual Cognition	
ARTG 5320	Statistics Basics for Designers	
ARTG 5330	Visualization Technologies	
ARTG 5650		
ARTG 6320	Design of Information-Rich Environments	
ARTG 6330	Information Design Mapping Strategies	

Other electives may be chosen in consultation with program coordinator.

Program Credit/GPA Requirements

60 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours
ARTG 5600	4	ARTG 6600	4
ARTG 5620	4	ARTG 6310	4
ARTG 5630	4	ARTG 5640	4
ARTG 5610	4	Elective	4
	16		16

Year 2

Fall	Hours	Spring	Hours
ARTG 6700	4	ARTG 7990	4
ARTG 7600	4	ARTG 7791	4
Elective	4	Elective	4
Elective	4		
	16		12

Total Hours: 60

Information Design and Visualization, MFA

The Master of Fine Arts in Information Design and Visualization focuses on the analytical and visual communication of information. Successful graduates are experts in the visual languages of data who produce effective and meaningful visual displays of abstract information. They collaborate with other professionals, researchers, or clients in a variety of fields and settings.

Students have an opportunity to gain an understanding of the principles of translating data and information into visual, material, and dynamic forms and to learn to integrate theoretical, visual, and technical aspects of structuring and representing data to provide a broad range of audiences increased access to socially relevant issues. The curriculum is built upon an established undergraduate program in graphic, information, and interaction design and seeks applicants from diverse fields of study—not just visual communications—who are interested in information visualization and communication of information through visual and analytical means. Practicing professionals and recent undergraduates in a variety of fields (architecture, graphic design, journalism, communications, business, the humanities, and sciences) who desire a fluency in information design should apply.

Graduates are prepared to work effectively in a dynamic and burgeoning field of practice and research in environments including design firms, research centers, corporations, academic institutions, and government and urban agencies. The program seeks to produce professionals skilled in design principles and practices needed to assume leadership roles in an evolving interdisciplinary field. Students will also be well positioned to pursue PhDs and academic careers.

Fall semester 1 is dedicated to foundations, including an introductory course in information visualization and visual communication, a seminar on the history of visualization, a studio course, and an introduction to programming with d3. Students with strong prior experience in programming can replace the latter course with an elective.

Spring semester 2 is dedicated to the exploration of diverse research topics. In Studio 2 you will create an interactive visualization project; in information design theory, you will obtain theoretical background in design theory and concept mapping; the research methods class will prepare you for the thesis process by introducing you to different research methods; and an open elective will allow you to pick a research theme you are interested in.

Fall semester 3 is dedicated to developing your thesis in theory and practice. All courses in this semester are dedicated to this goal, including the research seminar and the Studio 3 course. Two electives allow you to add competencies related to your thesis topic.

Fall semester 4 is finally all about finalizing the thesis and the thesis exhibition.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
ARTG 5100	Information Design Studio 1: Principles	4
ARTG 5110	Information Design History	4
ARTG 5120	Information Design Research Methods	4
ARTG 5130	Visual Communication for Information Design	4
ARTG 5330	Visualization Technologies	4
ARTG 6100	Information Design Studio 2: Dynamic Mapping and Models	4
ARTG 6110	Information Design Theory and Critical Thinking	4
ARTG 6200	Information Design Studio 3: Synthesis	4
Open Electives		
In consultation with faculty advisor, complete four courses from the following:		16
ARTG 5310	Visual Cognition	
ARTG 5320	Statistics Basics for Designers	
ARTG 6310	Design for Behavior and Experience	
ARTG 6320	Design of Information-Rich Environments	
ARTG 6330	Information Design Mapping Strategies	
ARTG 6900	Special Topics in Design	
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
Thesis		
ARTG 7100	Information Design Thesis Seminar	4
ARTG 7990	Thesis	8

Program Credit/GPA Requirements

60 total semester hours required

Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours
ARTG 5100	4	ARTG 5120	4
ARTG 5110	4	ARTG 6100	4
ARTG 5130	4	ARTG 6110	4
ARTG 5330	4	Open elective	4
	16		16

Year 2

Fall	Hours	Spring	Hours
ARTG 6200	4	ARTG 7990	8
ARTG 7100	4	ARTG 7991 Thesis E	
Open elective	4	Open elective	4
Open elective	4		
	16		12

Total Hours: 60

Interdisciplinary Arts, MFA

The **Master of Fine Arts in Interdisciplinary Arts** emphasizes the arts of social engagement, broadly conceived. Positioned at the intersection of the visual arts, architecture, music, visual and media studies, and the expanded field of design, the curriculum supports the development of ambitious projects by a diverse, international group of creative practitioners.

Students have an opportunity to learn to use the tools and insights of contemporary creative practice to intervene in public discourse through media, research-, and/or community-based methods. The curriculum centers around a series of core critique seminars that provide a foundation and home base for students who then customize their education from a wide array of studio and academic courses. Regular workshops with visiting faculty emphasize hands-on engagement in the creative process of leading artists, while offsite and international summer residencies allow students to complete self-directed projects, supported by online faculty and peer mentoring. The MFA degree requires a minimum 3.000 GPA over 60 semester hours of study, with 64 semester hours recommended.

The program seeks to help students articulate their goals, context, and audience and develop the professional skills necessary to sustain their practices. Successful graduates are prepared to forge their own paths as publicly engaged artists working independently or in arts organizations, social entrepreneurship ventures, the nonprofit sector, and as faculty in academic institutions.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Seminars Required Courses		
Enrollment in a section of each course is required each term. The format of the course is critique-seminar.		16
ARTD 5001	Art, Context, Action 1	
ARTD 5002	Art, Context, Action 2	
ARTD 6001	Art, Media, Participation 1	

ARTD 6002	Art, Media, Participation 2	
Studio Electives		
In consultation with faculty advisor, complete four courses from the following:		16
ARTD 5101	Interactive Media Arts 1	
ARTD 5202	Photographic Media in Cultural Context	
ARTD 5582	Collaborative Video and Community Engagement	
ARTD 6101	Interactive Media Arts 2	
ARTD 6201	Interactive Mobile Art Apps	
ARTE 5901	Special Topics in Art and Design Studio	
ARTG 5100	Information Design Studio 1: Principles	
ARTG 5310	Visual Cognition	
ARTG 5330	Visualization Technologies	
ARTG 5620	Notational Systems for Experience	
ARTG 6100	Information Design Studio 2: Dynamic Mapping and Models	
ARTS 5100	Visual Ideation	
ARTS 6000	Studio	
ARTS 7896	Studio Continuation	
Art History Electives		
Complete three courses from the following:		12
ARTH 5100	Contemporary Art Theory and Criticism	
ARTH 5200	Issues in Contemporary Art	
ARTH 5300	Postmodernism: Theory and Practice in the Visual Arts	
ARTH 5400	Contemporary Visual Culture	
ARTH 5500	Art and New Media: History and Theory	
ARTH 5902	Special Topics in Art and Design History	
ARTH 6901	Special Topics in Contemporary Art	
ARTE 6211	Art Criticism by Artists	

Research, Thesis, and Exhibition

Research Methods		
In consultation with faculty advisor, complete one course from the following:		4
ARTG 5120	Information Design Research Methods	
ARTE 6210	Research Methods for the Creative Arts	
GSND 5130	Usability and Empirical User Research	
Independent Research		
Complete one from the following:		4
ARTD 5301	Independent Research Project 1	
ARTD 6301	Independent Research Project 2	
Thesis and Exhibition		
ARTE 7100	Thesis Proposal	4
ARTE 7990	Thesis	4
ARTE 7996	Thesis Continuation	0

Program Credit/GPA Requirements

60 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Sample plan of study.

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ARTD 5001	4	ARTD 5002	4	Studio elective or		Studio elective or	
History, theory, and critical studies elective	4	History, theory, and critical studies elective	4	ARTD 5301	4	ARTD 6301	4
Studio elective	4	Research methods	4				
		Studio elective	4				
	12		16		4		4

Year 2

Fall	Hours	Spring	Hours
ARTD 6001	4	ARTD 6002	4
ARTE 7100	4	ARTE 7990	4
History, theory, and critical studies elective	4		
Studio elective	4		
	16		8

Total Hours: 60

Experience Design, MS

The Master of Science in Experience Design embraces research-driven design thinking for entrepreneurship, innovation, and other areas, preparing students to be vital contributors and leaders at the intersection of innovation and design.

Experience design is a holistic and integrative approach to design that utilizes investigation into the human experience in specific situations to improve its quality, given an understanding of human goals, needs, and desires. For example, in the context of healthcare, an experience designer does not focus on the design of any one technology product, information system, or physical space. Instead, the designer is charged with understanding and improving the overall sequence of events that impact the patient before and during a hospital stay as well as through follow-up care.

The experience design program moves beyond design thinking to produce outcomes that demonstrate the value of human-centered research and design methods. It draws on findings from a range of professional and scholarly disciplines (including business, psychology, human-computer interaction, engineering, cybernetics) to understand and shape specific situations. It extends across many industries and aspects of life: healthcare, technology, services, travel, education, entertainment, shopping, dining, and the nature of work itself.

Through examining how people behave in a *real* context in relation to emerging technologies, the Master of Science in Experience Design allows graduates from design and related disciplines (such as communications, computer science, business, architecture, art, journalism, humanities, and the social sciences) to gain knowledge and experience in the design competencies. To accomplish these

goals, students will learn how to invoke cooperation, collaboration, and integration across disciplines and practices.

The Master of Science in Experience Design seeks to prepare students to be vital contributors and leaders of professional experience design teams where technological innovation intersects with design. Successful graduates will be able to analyze how people undergo real-world situations, enabling them to enrich experience by orchestrating new design-driven relationships. They will be equipped with the skills to identify shortcomings as well as opportunities for improved engagement between systems and elements—virtual or physical—with the humans who encounter them.

The MS degree is intended for graduate students from related fields—media, design, communications, data science, and more—who would like to acquire competencies in experience design to complement their skills and address their professional needs. Embedded in the course offering of our Master of Fine Arts in Experience Design (p. 48) program, students in the MS program will have the opportunity to join MFA students for activities such as attending guest lectures and workshops.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
ARTG 5600	Experience Design Studio 1—Principles	4
ARTG 5610	Design Systems	4
ARTG 5620	Notational Systems for Experience	4
ARTG 5630		4
ARTG 6310	Design for Behavior and Experience	4
ARTG 6600		4
Electives		
Complete two of the following:		8
ARTG 5310	Visual Cognition	
ARTG 5320	Statistics Basics for Designers	
ARTG 5330	Visualization Technologies	
ARTG 5640		
ARTG 5650		
Other electives may be chosen in consultation with program coordinator.		

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours
ARTG 5600	4	ARTG 6600	
ARTG 5620	4	ARTG 6310	4
ARTG 5610	4	Elective	4
ARTG 5630		Elective	4
	12		12

Total Hours: 24

Arts Administration and Cultural Entrepreneurship, Graduate Certificate

The arts sector is more vital and dynamic than ever, flourishing in major arts institutions and "non-hierarchical organizations," including artist-run spaces and community organizations. This context, paired with changes in the nonprofit funding climate of the past 30 years, has generated a need to transform leadership training in the arts sector. Increasingly, creative thinkers must be equipped with administrative, analytical, entrepreneurial, and technological skill sets to work within the complex, interdependent arts and cultural ecosystem. In response, the Graduate Certificate in Arts Administration and Cultural Entrepreneurship offers an interdisciplinary graduate program focused on leadership innovation in nonprofit performance, visual arts, cultural, and community organizations.

The **Graduate Certificate in Arts Administration and Cultural Entrepreneurship** challenges students to create diverse, viable, and sustainable arts and culture projects and organizations; to use entrepreneurial practices in order to create transformation; to develop and deploy new arts and culture sector-focused business and analytic skills; and to design innovative planning and engagement strategies. Course and project work contains embedded experiential opportunities to explore and demonstrate transformational arts management approaches. This program is offered 100 percent online.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
AACE 6000	Arts and Culture Organizational Leadership	3
AACE 6010	Planning for Arts and Cultural Organizations	3
AACE 6020	Experiential Study in Arts Administration	3
Elective Course		
Complete one of the following:		3
AACE 6110	Information Technology for Arts and Cultural Organizations	
AACE 6200	Programming and Community Engagement for Cultural Entrepreneurs	
AACE 6210 [1]		

[1] For course title, please see college administrator.

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Cultural Entrepreneurship, Graduate Certificate

Cultural entrepreneurs combine creative, cultural, social and entrepreneurial spirit to forward innovation goals that invest in culture while solving problems with market-based approaches for the greater good. Cultural entrepreneurship is closely related to social entrepreneurship in that both aim to bring about social change by devising a solution – be that a roving theater company or a smartphone app for artistic collaboration – that generates a positive impact on

communities. Cultural entrepreneurs may seek to shift attitudes and change behavior but always to influence culture.

The cultural tools now at an entrepreneur's disposal are myriad and a cultural entrepreneur must possess a skill set rooted in several disciplines. In addition to critical, creative perspective, administrative acumen, organizational and analytical skills and deep cultural awareness, a cultural entrepreneur must understand how arts, design and media can forward community goals. A cultural entrepreneur must also be savvy with the digital tools and new media techniques that can be leveraged to attract attention and achieve those cultural innovation goals.

The Graduate Certificate in Cultural Entrepreneurship empowers students with the tools and competency to create diverse, viable and sustainable projects and organizations to address social and cultural issues. The goal of the certificate program is to prepare creative practitioners and culturally-minded innovators to become valuable contributors to the fields of arts, culture, and community at large. The curriculum offers students the opportunity to identify shortcomings and opportunities for evolution in the arts and cultural sectors, to develop or hone critical, creative practices, leadership acumen, arts administrative and analytical skills, to conceive of and implement programming for community engagement and positive impact, and to bring these skills and frameworks to bear on cultural challenges. Graduates will be introduced to and have opportunities to demonstrate knowledge relative to formulating arts and culture-based strategies, organization, initiatives and technologies that build both economic and cultural capital.

The program learning objectives provide students with opportunities to:

- Develop an understanding of methods and tools used to conceptualize, scope, pilot, evaluate, iterate and launch cultural entrepreneurship projects;
- Align creative practice and arts enterprise strategies with opportunities, challenges and resources to achieve varied forms of impact;
- Apply communication, engagement and evaluation techniques to develop and sustain diverse audiences and stake holders;
- Engage in critical analysis of the work of peers and industry leaders by analyzing and contextualizing the quality, viability and sustainability of culturally-driven entrepreneurship.

The required curriculum includes three core courses and one directed elective for a total of 12 credit hours. All core and in-program elective courses are available online.

PROGRAM REQUIREMENTS:

- Core Courses (9 credit hours) – AACE 6200, AACE 6220 and AACE 6210 (the latter course will be submitted in the fall for approval)
- Elective (3 credit hours)
- 12 credit hours and minimum 3.0 GPA required for the certificate

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
AACE 6200	Programming and Community Engagement for Cultural Entrepreneurs	3
AACE 6210		
AACE 6220		
Elective Course		
Complete one of the following:		3
AACE 6000	Arts and Culture Organizational Leadership	
AACE 6010	Planning for Arts and Cultural Organizations	
AACE 6110	Information Technology for Arts and Cultural Organizations	
ENTR 6212	Business Planning for New Ventures	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Experience Design, Graduate Certificate

The Graduate Certificate in Experience Design embraces research-driven design thinking for entrepreneurship, innovation, and other areas, preparing students to be vital contributors and leaders at the intersection of innovation and design.

Experience design is a holistic and integrative approach to design that utilizes investigation into the human experience in specific situations to improve its quality, given an understanding of human goals, needs, and desires. For example, in the context of healthcare, an experience designer does not focus on the design of any one technology product, information system, or physical space. Instead, the designer is charged with understanding and improving the overall sequence of events that impact the patient before and during a hospital stay as well as through follow-up care.

The Graduate Certificate in Experience Design moves beyond design thinking to produce outcomes that demonstrate the value of human-centered research and design methods. It draws on findings from a range of professional and scholarly disciplines (including business, psychology, human-computer interaction, engineering, cybernetics) to understand and shape specific situations. It extends across many industries and aspects of life: healthcare, technology, services, travel, education, entertainment, shopping, dining, and the nature of work itself.

Through examining how people behave in a *real* context in relation to emerging technologies, the Graduate Certificate in Experience Design allows working professionals or graduates from design and related disciplines (such as communications, computer science, business, architecture, art, journalism, humanities, and the social sciences) to gain knowledge and experience in the design competencies. To accomplish these goals, students need to learn how to invoke cooperation, collaboration, and integration across disciplines and practices.

The Graduate Certificate in Experience Design is designed to prepare students to be vital contributors and leaders of professional experience design teams where technological innovation intersects with design. Successful graduates will be able to analyze how people undergo real-world situations, enabling them to enrich experience by orchestrating new design-driven relationships. They will be equipped with the skills to identify shortcomings as well as opportunities for improved engagement between systems and elements—virtual or physical—with the humans who encounter them.

The certificate is intended for practitioners and graduate students from related fields—media, design, communications, data science, and

more—who would like to acquire competencies in experience design to complement their skills and address their professional needs. Embedded in the course offering of our Master of Fine Arts in Experience Design (p. 48) program, students in the certificate program will have the opportunity to join MFA students for activities such as attending guest lectures and workshops.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
ARTG 5610	Design Systems	4
ARTG 5620	Notational Systems for Experience	4
ARTG 6310	Design for Behavior and Experience	4
Elective		
Complete 4 semester hours of 5000 to 6000 level course work in the following subject area:		4
ARTG		

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Information Design and Visualization, Graduate Certificate

The Graduate Certificate in Information Design and Visualization focuses on the data-driven analytical and visual design of information, preparing students to communicate visually while engaging advanced data analytics to produce meaningful information environments.

Successful graduates of the Certificate in Information Design and Visualization are professionals who are prepared to tackle new information communication challenges and communicate and collaborate with researchers in a variety of fields, as well as stakeholders and the public. Throughout the course of the certificate, students master how to think visually, while also learning how to produce effective, meaningful visual information from various sources of data.

The certificate is intended for practitioners and graduate students from related fields—media, design, communications, data science, and more—who would like to acquire competencies in information design and data visualization to complement their skills and address their professional needs. Embedded in the course offering of our Master of Fine Arts in Information Design and Visualization (http://www.northeastern.edu/camd/artdesign/academic-programs/mfa-in-information-design-and-visualization) program, students in the certificate program will have the opportunity to join MFA students for activities such as attending guest lectures and workshops.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
ARTG 5130	Visual Communication for Information Design	4
ARTG 5330	Visualization Technologies	4
Electives		
Complete two from the following:		8
ARTG 5100	Information Design Studio 1: Principles	
ARTG 5110	Information Design History	
ARTG 5310	Visual Cognition	
ARTG 6100	Information Design Studio 2: Dynamic Mapping and Models	
ARTG 6310	Design for Behavior and Experience	
ARTG 6320	Design of Information-Rich Environments	
ARTG 6330	Information Design Mapping Strategies	
ARTG 6900	Special Topics in Design	
ARTG 5000 or 6000 level course		

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Game Design

Website (http://www.northeastern.edu/camd/gamedesign)

Tad Hirsch, PhD
Chair

239 Ryder Hall
617.373.2347
Dara-Lynn Pelechatz, Administrative Officer, D.Pelechatz@northeastern.edu

Casper Harteveld
Assistant Professor and Graduate Coordinator
140 Meserve Hall
617.373.4027
c.harteveld@northeastern.edu

The game design program offers a Master of Science in Game Science and Design. The degree is joint between the College of Arts, Media and Design and the College of Computer and Information Science. This MS degree is focused on the science and design of game development. The degree will weave the design and technology necessary to build a game but focus on the playability and analytics to make the product successful, thus creating a coherent vision enabling students to understand the process of creating successful game products in a player-centric environment.

The degree offers three concentrations:

- Game analytics: focusing on data analysis of gameplay and other game data to make the game successful
- Game user research: focusing on gauging the user experience to enable designers to develop an enjoyable game experience
- Game design and development: focusing on the design or technical side of game development

Admissions Requirements

Applicants must submit an official application, including the following documents: official transcripts, a statement of purpose projecting their career goals, a description of any experience in the games field and/or a portfolio if available, official GRE General Test, and three letters of recommendation. International students must also submit official scores of the TOEFL examination. Acceptance to the Master of Science in Game Science and Design program is granted upon recommendation

from the master's admissions committee after review of the completed application.

Applicants will be expected to have a minimum 3.000 undergraduate grade-point average (GPA). International applicants must have a minimum TOEFL score of 100 (internet based) or 250 (computer based) or a minimum IELTS of 6.0.

We will consider applications from students who hold a bachelor's degree from any of the following fields or closely related fields:

- Computer science
- Information science
- Informatics
- Engineering
- Human computer interaction
- Psychology
- Social science
- Interaction design
- Game design

All admitted students will be assigned to an advisor who will help them select a pathway with a coherent set of electives depending on their career goals. The advisor will also monitor their progress through the master's degree.

Degree Requirement

This is a two-year, 34-semester-hour degree.

Programs

Master of Science (MS)

- Game Science and Design (p. 55)

Graduate Certificate

- Game Analytics (p. 56)

Game Science and Design, MS

The **Master of Science (MS) in Game Science and Design** is a program that seeks to give students a comprehensive understanding of how successful game products are created in a player-centric environment. Focusing on the science of game development, students have an opportunity to learn the design and technological skills needed to build a game and develop a deep understanding of playability and analytics that make products successful in an increasingly competitive marketplace.

The game industry has expanded to include social and mobile gaming; games in health, education, and training; and innovations in play psychology, middleware, graphics tools, game mechanics, game evaluation methods, and advanced artificial intelligence and narrative techniques. It has become an increasingly competitive space.

The selectiveness of the industry and the diversity of the skills required mean that students seeking entry need both broad and deep skills. As an emergent industry using diverse technology and collaborative practices, the game industry needs professionals with interdisciplinary skill sets who can meld knowledge about development with knowledge about evaluation methods and players' behavior and psychology.

Jointly offered by Northeastern's Colleges of Arts, Media and Design and Computer and Information Science (http://www.ccs.neu.edu), the **Master in Science in Game Science and Design** is a one-of-a-kind interdisciplinary program that seeks to prepare students to meet this need by weaving together science and design. This is a two-year, 34-credit-hour program.

The degree offers three concentrations:

- Game analytics: focusing on data analysis of gameplay and other game data to make the game successful
- Game user research: focusing on gauging the user experience to enable designers to develop an enjoyable game experience
- Game design and development: focusing on the design or technical side of game development

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

GSND 5110	Game Design and Analysis	4
GSND 5111	Seminar for GSND 5110	1
GSND 5122	Business Models in the Game Industry	1
GSND 5130	Usability and Empirical User Research	4
or PPUA 5301	Introduction to Computational Statistics	

Specialization Options

Complete one of the following specializations. In consultation with your faculty advisor, declare one specialization option by spring of your first year.

GAME ANALYTICS

Complete three of the following:		12
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
GSND 6350	Game Analytics	
PPUA 5302	Information Design and Visual Analytics	

GAME USER RESEARCH

Complete three of the following:		12
CS 5340	Computer/Human Interaction	
GSND 6320	Psychology of Play	
GSND 6330	Game User Research	
GSND 6340	Advanced Game User Research	

GAME DESIGN AND DEVELOPMENT

Complete three of the following:		12
CS 5150	Game Artificial Intelligence	
CS 5850	Building Game Engines	
GSND 6240	Exploratory Concept Design	
GSND 6250	Spatial and Temporal Design	

Electives

Note: In consultation with your faculty advisor, you may complete two other related courses offered by all options.

Complete two of the following:		8
CS 5150	Game Artificial Intelligence	
CS 5340	Computer/Human Interaction	
CS 5850	Building Game Engines	
DA 5020	Collecting, Storing, and Retrieving Data	

DA 5030	Introduction to Data Mining/Machine Learning
GSND 6240	Exploratory Concept Design
GSND 6250	Spatial and Temporal Design
GSND 6330	Game User Research
GSND 6320	Psychology of Play
GSND 6340	Advanced Game User Research
GSND 6350	Game Analytics
PPUA 5302	Information Design and Visual Analytics

Thesis/Project

GSND 7990	Thesis	4
or GSND 7995	Games Project	

Program Credit/GPA Requirements

34 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours
GSND 5110	4	Concentration elective	4
GSND 5111	1	Concentration elective	4
GSND 5130 or 6301	4		
	9		8

Year 2

Fall	Hours	Spring	Hours
GSND 5122	1	General elective	4
Concentration elective	4	GSND 7990 or 7995	4
General elective	4		
	9		8

Total Hours: 34

Game Analytics, Graduate Certificate

The Graduate Certificate in Game Analytics offers students an opportunity to obtain the ability to analyze vast amounts of data, which has become critical as big data has rapidly become a competitive space across multiple industries from games to healthcare, urban planning, and social media.

In the game industry, data-driven techniques for analyzing game data have become a strategic necessity. The game development process has shifted from “design, develop, release” to “design, develop, release, and continuously fine-tune based on analytics.” All free-to-play games on mobile, tablets, touch devices, and web-delivered platforms use analytics to develop strategies for monetization and assessment.

As game companies have realized the importance of data analytics in the process of design and production, they have dramatically increased the demand for qualified game analysts. Northeastern’s unique Graduate Certificate in Game Analytics is a one-year, 20-semester-hour program developed to meet this need.

Admissions Requirements

Students are considered based on their application package, which includes the following documents:

- Statement of purpose projecting career goals and/or relevant work experience
- A description of any experience in the games field and/or a portfolio, if available
- Transcripts of undergraduate degree with a minimum grade-point average (GPA) of 3.000
- General GRE scores
- Minimum TOEFL score of 100 (internet based) or 250 (computer based) or IELTS score of 6.0 for international students who have a bachelor’s degree from a non–English-speaking country
- Three letters of reference from individuals who understand the student’s potential for graduate study

Acceptance is based on an assessment of the student’s ability to succeed in the advanced course work of the program.

All admitted students meet with an advisor who helps them select a pathway with a coherent set of electives depending on their career goals. The advisor also monitors their progress throughout the course work.

Program Requirements

Complete all five courses and requirements listed below unless otherwise indicated.

Requirements

Data Science Core		
DA 5020	Collecting, Storing, and Retrieving Data	4
DA 5030	Introduction to Data Mining/Machine Learning	4
PPUA 5302	Information Design and Visual Analytics	4
Game Science and Design Core		
GSND 5110	Game Design and Analysis	4
GSND 6350	Game Analytics	4

Program Credit/GPA Requirements

20 total semester hours required
Minimum 3.000 GPA required

School of Journalism

Website (http://www.northeastern.edu/camd/journalism)

Jonathan Kaufman, MA
Professor and Director

102 Lake Hall
617.373.3236
617.373.8773 (fax)
Gladys Mckie, MS, Graduate Coordinator, g.mckie@northeastern.edu

Welcome to the graduate programs at Northeastern University’s School of Journalism. Our school offers a Master of Arts in Journalism. The Master of Arts in Journalism degree is designed to merge traditional journalism with the latest technology. Students new to the field or those with experience can choose one of two tracks—professional journalism or media innovation—to prepare them for the challenges faced by legacy and new media in the digital age. Moreover, the program offers

students hands-on training in preparation for careers in reporting, editing, multimedia design and production, social media, and data journalism.

As part of Northeastern's College of Arts, Media and Design, our graduate students are also part of an interdisciplinary and creative community. Our core curriculum is supplemented by electives that take advantage of course offerings from within our college and from other colleges in the university. And with our experiential education opportunities and outstanding co-op program, students do not have to wait until after graduation to begin developing skills as reporters, media advocates, or public relations professionals.

It is our goal to help you put your passion into practice. To that end, our graduate programs afford students the opportunity to study in Boston with a small and dedicated faculty of specialists with years of experience and extensive contacts in the media world.

Programs

Master of Arts (MA)

- Journalism (p. 57)

Journalism, MA

The School of Journalism offers two pathways in a Master of Arts degree that seeks to prepare students for the challenges faced by legacy and new media in the digital age.

Students new to the field or those with experience can choose programs tailored to help them thrive during this time. Our programs are designed to merge traditional journalism with the latest information technology. Our professional track is designed for those with little or no journalism experience who want to pursue a career in journalism. Our media innovation track is designed for students with previous journalism experience who want to learn digital and multimedia skills.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Course

JRNL 6340	Fundamentals of Digital Journalism	4

Tracks

Complete one of the following two tracks:

PROFESSIONAL TRACK

Required Course Work

JRNL 6200	Enterprise Reporting 1	4
JRNL 6201	Enterprise Reporting 2	4
JRNL 6202	Perspective on Journalism Ethics	4

Electives

Complete 20 semester hours from the following areas:	20
JRNL 5309 to JRNL 6305	
JRNL 6310 to JRNL 7976	
Courses from other disciplines may be taken in consultation with your faculty advisor.	

MEDIA INNOVATION TRACK

Required Course Work

JRNL 6306	Media Innovation Studio 1	4
JRNL 6307	Media Innovation Studio 2	4
JRNL 6341	Telling Your Story with Data	4

Electives

Complete 16 semester hours from the following areas:	16
ARTG 5100 to ARTG 6900	
ARTE 5901 to ARTE 6211	
ARTH 5100 to ARTH 6901	
CS 5010 to CS 5976	
CS 6110 to CS 6810	
CS 7170 to CS 7880	
Courses in the following disciplines may be taken in consultation with your faculty advisor:	
ACCT, BUSN, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, MGSC, SCHM, STRT, and TECE	

Program Credit/GPA Requirements

32 total semester hours required for Media Innovation Track
36 total semester hours required for Professional Track
Minimum 3.000 GPA required

Music

Website (http://www.northeastern.edu/camd/music)

Daniel Strong Godfrey, PhD
Professor and Chair

351 Ryder Hall
617.373.2776
617.373.4129 (fax)
Andrew Mall, Assistant Professor and Graduate Coordinator,
a.mall@northeastern.edu

The Master of Science in Music Industry Leadership (MS.MIL) program is an intensive one-year leadership program designed for individuals who want to manage the next generation of music companies (students who choose to do a co-op typically take longer than one year to complete the MS.MIL program). The MS.MIL offers advanced education in the areas of music management, leadership, research, and entrepreneurship with opportunities for immediate and ongoing application to each student's unique professional aspiration.

The Master of Science program focuses on the core scholarly areas of music industry. Courses seek to provide a solid foundation in music industry theory and analysis while offering students the opportunity to apply the foundational skills to an area of personal interest. Elective courses emphasize the creation and sustainability of music organizations in a rapidly evolving environment. Using an active-learning approach, the program focuses on developing music executives intellectually and ethically, while providing them with a keen appreciation for the complexities of managing in the creative industries. This approach focuses on long-term skill sets that enhance the potential of graduates within a fluid and ever-changing field. The program also emphasizes global leadership qualities that provide a broader vision of the music industry on an international level.

The JD/MS in Music Industry Leadership is a dual-degree program that offers students a variety of opportunities for real-world, experiential learning at the intersection of law and music business. Candidates for the JD/MS program must independently apply and gain admission to the School of Law and the College of Arts, Media and Design. Admission to one school does not ensure admission to the other. Candidates may apply to both schools prior to matriculation at the law school, or students

may wait until they are enrolled in the School of Law before seeking admission to the College of Arts, Media and Design. During either the first or second year of law school, students may apply to the MS program during the winter or spring for enrollment the following September. Students enrolled in law school who are interested in pursuing this dual degree should contact the Office of Academic and Student Affairs and Professor Kara Swanson, JD/MS faculty advisor, during the fall or winter of their first or second year for further information.

Curriculum

The MS.MIL program requires a minimum of 33 semester hours and 11 courses with a grade-point average (GPA) of 3.000 for graduation. Under consultation with the graduate coordinator, students choose courses and other curricular options (such as co-ops, research theses, directed studies, or entrepreneurial capstones) to highlight a student's strengths and longer-term goals.

Programs

Master of Science (MS)

- Music Industry Leadership (p. 58)

Dual Degree (JD/MS)

- Music Industry Leadership (p. 61)

Certificate

- NEC/NU Joint Certificate Program—General Certificate of Merit in Music Performance (p. 58)
- NEC/NU Joint Certificate Program—Professional Studies Certificate in Music Performance (p. 60)

Music Industry Leadership, MS

Engaged with the Industry—and the World

Leveraging Northeastern's excellence in global experiential learning, our program allows students to study in Boston and gain real-world experience in New York, Nashville, Los Angeles, and other music capitals across the world.

Expert Faculty

With real-world research and professional experience with the issues facing today's music industry, our exceptional faculty bring fresh insight and innovation to their teaching.

Options

Students shape their own curriculum, following paths that meet personal and professional aspirations through a focus on practice, entrepreneurship, the profession, and research. We also offer a joint JD/Music Industry Leadership program in partnership with the Northeastern University School of Law.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
MUSI 6000	Management of Music Organizations	3
MUSI 6100	Music Industry Research Methodology	3
MUSI 6200	Financial Management in the Music Industry	3
MUSI 6300	Intellectual Property for Music Management	3
MUSI 6400	Marketing Strategies in the Music Industry	3
Electives [1]		
Complete 18 semester hours in the following subject areas:		18
MUSI 5000 level or above		
AACE 6000 level or above		

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

[1] Electives in other disciplines may be taken in consultation with your faculty advisor. A maximum of 6 semester hours of electives may be taken outside the College of Arts, Media and Design.

NEC/NU Joint Certificate Program—General Certificate of Merit in Music Performance

The School of Continuing Education at the New England Conservatory (NEC) and the Department of Music at Northeastern University (NU) jointly offer a General Certificate of Merit in Music Performance (24 credits) and a Professional Studies Certificate in Music Performance (48 credits). These programs are geared toward Northeastern undergraduate and graduate students who are interested in improving their abilities to perform on an instrument or voice in the classical or jazz styles.

The certificate in music performance is *in addition to* the student's Northeastern undergraduate or graduate degree—it is an entirely separate and distinct credential. Credits for courses toward the music performance certificate are accumulated and billed separately from credits toward Northeastern undergraduate or graduate degree programs and are not eligible for financial aid.

Courses are offered at NEC (predominantly related to music performance) and at NU (predominantly related to music history and music theory). NEC courses are scheduled during evenings and weekends.

Program Requirements

Northeastern University Requirements

Complete 11 credits of course work at Northeastern University as indicated below.

Music Theory and Musicianship Placement		
All students must take a theory placement exam. Students who do not place into MUSC 1201 or MUSI 1203 must first take the following course:		
MUSC 1119	Fundamentals of Western Music Theory	4
Credits for MUSC 1119 do not count toward the certificate.		
Music Theory and Musicianship		
Music theory and musicianship courses should be taken concurrently. [1]		
MUSC 1201	Music Theory 1	4
Music History		
Complete one of the following:		4
MUSC 1104	Survey of African-American Music	
MUSC 1105	Music of the USA	
MUSC 1111	Rock Music	

MUSC 1112	Jazz	
MUSC 1121	Medieval and Renaissance Music	
MUSC 1122	Music of the Baroque Era	
MUSC 1123	Music of the Classical Era	
MUSC 1124	Music of the Romantic Era	
MUSC 1125	20th-Century Music	
Note: Since the following course is repeatable, music majors and combined majors may count the credits for the second time they take this course toward the music performance certificate:		
MUSC 3550	Historical Traditions: Special Topics	
Ensembles		
Complete two music ensembles:		2
MUSC 1904	Chorus	
MUSC 1905	Concert Band	
MUSC 1906	Orchestra	
MUSC 1907	Wind Ensemble	
MUSC 1911	Jazz Ensemble	
MUSC 1912	Rock Ensemble	
MUSC 1913	Blues/Rock Ensemble	
MUSC 1914	Create Your Own Music	
MUSC 1915	Chamber Ensemble	
MUSC 1916	Contemporary Music Ensemble	
MUSC 1917	Jazz Choir and Combo	
MUSC 1918	World Music Ensemble	
MUSC 1919	Fusion Ensemble	
MUSC 1920	Pep Band	
MUSC 1921	World Fusion Ensemble	

[1] Music majors with a concentration in music industry may substitute Music Theory for Music Industry 1 (MUSI 1203) and Musicianship 1 (MUSC 1241).

New England Conservatory Requirements

Complete 13 credits of course work at New England Conservatory School of Continuing Education as indicated below.

Private Studio Instruction		
Complete 8 credits of (repeatable) private studio instruction with New England Conservatory School of Continuing Education faculty. These credits may be accumulated in units of 2, 3, or 4 credits per semester. All private lessons require audition by NEC/NU faculty in order to assign private teacher placement. After being placed with a private teacher, and working with their certificate advisor, students must confirm with that teacher the length and number of lessons they will receive.		8
MPNC 1102	Music Instruction	
MPNC 1103	Music Instruction	
MPNC 1104	Music Instruction	
Music Technology		
MPNC 1201	Contemporary Music Production and Technology 1	1
Electives		
Complete 3 credits from the following:		3
MPNC 1301	Build Your Voice: Art/Skillful Singing	
MPNC 1401	Jazz Ear Training 1	
MPNC 1411	Jazz Theory 1	
MPNC 1421	Finale Chart Writing	
MPNC 1451	Jazz History 1	
MPNC 1501	Introduction to Music-in-Education	
MPNC 1612	Group Piano Class	
MPNC 1621	The Art of Musical Sight-Reading	
MPNC 1622	The Art of Practice and Performance	
MPNC 1623	Developing Perfect Pitch 1	
MPNC 1631	The Accidental Music Teacher: From Musical Artist to Creative Educator	
MPNC 1642	Sight-Singing for Singers	
MPNC 1801	Introduction to Composition 1	
MPNC 1802	Contemporary Improvisation: Skill Building	
MPNC 1803	Contemporary Improvisation: Music of the World—The African Diaspora	
MPNC 1901	Art and Soul of Cinema: An Appreciation of Film Music	
MPNC 1911	Latin American Classical Traditions 1	
MPNC 2401	Jazz Ear Training 2	
MPNC 2411	Jazz Theory 2	
MPNC 2431	Jazz Composition and Analysis	
MPNC 2451	Jazz History 2	
MPNC 2511	Music-in-Education Seminar	
MPNC 2512	Models for Teaching and Learning for Music-in-Education	
MPNC 2525	Art and Science of Assessing Music Learning	
MPNC 2526	Music, Brain Development, and Learning	
MPNC 2547	Cross-Cultural Alternatives for Music-in-Education	
MPNC 2548	Teaching and Learning with Music Technology	
MPNC 2556	Improvisation in Music Education	
MPNC 2561	String Pedagogy	
MPNC 2571	Performing Artists in Schools	
MPNC 2601	Music Production for Media	
MPNC 2612	Piano Pedagogy	
MPNC 2623	Developing Perfect Pitch 2	
MPNC 2624	Advanced Perfect Pitch	
MPNC 2644	Bach/Handel Arias for Singers	
MPNC 2801	Introduction to Composition 2	
MPNC 2911	Latin American Classical Traditions 2	
MPNC 3401	Jazz Ear Training 3	
MPNC 3411	Jazz Theory 3	
MPNC 3431	Jazz Arranging	
MPNC 3611	Piano Interpretation/Performance Seminar	
MPNC 3631	18th-Century Tonal Counterpoint	
MPNC 3633	Modal Counterpoint	
MPNC 3641	Dramatic Coaching of Songs and Arias	
MPNC 3643	Vocal Repertoire: Coaching and Performance	
MPNC 3801	Composition Seminar 1	

MPNC 3802	Composition Seminar 2	
MPNC 4401	Jazz Ear Training 4	
MPNC 4411	Jazz Theory 4	
MPNC 4581	Music-in-Education Guided Internship	
MPNC 4591	Music-in-Education Portfolio	
Ensemble		
Complete one music ensemble:		1
MPNC 1712	Baroque Ensemble	
MPNC 1713	NEC Voices: A New Choral Experience	
MPNC 1714	Renaissance Ensemble	
MPNC 1716	Contemporary Improvisation Ensemble: Walking between Worlds	
MPNC 1721	Guitar Ensemble 1	
MPNC 1731	Jazz Ensemble	
MPNC 1741	Chamber Music Ensemble	
MPNC 1742	Chamber Music Duo	
MPNC 1751	Vocal Chamber Music	
MPNC 1771	Improvisation and Composition Ensemble	
MPNC 1781	Medieval Folk Roots Ensemble	
MPNC 3642	Opera Ensemble Skills	

NEC/NU Joint Certificate Program—Professional Studies Certificate in Music Performance

The School of Continuing Education at the New England Conservatory (NEC) and the Department of Music at Northeastern University (NU) jointly offer a General Certificate of Merit in Music Performance (24 credits) and a Professional Studies Certificate in Music Performance (48 credits). These programs are geared toward Northeastern undergraduate and graduate students who are interested in improving their abilities to perform on an instrument or voice in the classical or jazz styles.

The certificate in music performance is *in addition to* the student's Northeastern undergraduate or graduate degree—it is an entirely separate and distinct credential. Credits for courses toward the music performance certificate are accumulated and billed separately from credits toward Northeastern undergraduate or graduate degree programs and are not eligible for financial aid.

Courses are offered at NEC (predominantly related to music performance) and at NU (predominantly related to music history and music theory). NEC courses are scheduled during evenings and weekends.

Program Requirements

Northeastern University Requirements

Complete 22 credits of course work at Northeastern University as indicated below.

Music Theory and Musicianship Placement		
All students must take a theory placement exam. Students who do not place into MUSC 1201 or MUSI 1203 must first take the following course:		
MUSC 1119	Fundamentals of Western Music Theory	
Credits for MUSC 1119 do not count toward the certificate.		
Music Theory and Musicianship		
Music theory and musicianship courses should be taken concurrently. [1]		
MUSC 1201	Music Theory 1	4
MUSC 1202	Music Theory 2	4
Music History		
Complete one of the following:		4
MUSC 1104	Survey of African-American Music	
MUSC 1105	Music of the USA	
MUSC 1111	Rock Music	
MUSC 1112	Jazz	
MUSC 1121	Medieval and Renaissance Music	
MUSC 1122	Music of the Baroque Era	
MUSC 1123	Music of the Classical Era	
MUSC 1124	Music of the Romantic Era	
MUSC 1125	20th-Century Music	
Note: Since the following course is repeatable, music majors and combined majors may count the credits for the second time they take this course toward the music performance certificate:		
MUSC 3550	Historical Traditions: Special Topics	
Ensembles		
Complete 6 credits of music ensembles:		6
MUSC 1904	Chorus	
MUSC 1905	Concert Band	
MUSC 1906	Orchestra	
MUSC 1907	Wind Ensemble	
MUSC 1911	Jazz Ensemble	
MUSC 1912	Rock Ensemble	
MUSC 1913	Blues/Rock Ensemble	
MUSC 1914	Create Your Own Music	
MUSC 1915	Chamber Ensemble	
MUSC 1916	Contemporary Music Ensemble	
MUSC 1917	Jazz Choir and Combo	
MUSC 1918	World Music Ensemble	
MUSC 1919	Fusion Ensemble	
MUSC 1920	Pep Band	
MUSC 1921	World Fusion Ensemble	
Recital Preparation and Performance		
MUSC 3410	Recital 1	1
MUSC 4622	Recital 2	1

[1] Music majors with a concentration in music industry may substitute Music Theory for Music Industry 1 (MUSI 1203) and Musicianship 1 (MUSC 1241); Analyzing Popular Genres (MUSI 1204) and Musicianship 2 (MUSC 1242).

New England Conservatory Requirements

Complete 26 credits of course work at New England Conservatory School of Continuing Education as indicated below.

Private Studio Instruction

Complete 16 credits of (repeatable) private studio instruction with New England Conservatory School of Continuing Education faculty. These credits may be accumulated in units of 2, 3, or 4 credits per semester. All private lessons require audition by NEC/NU faculty in order to assign private teacher placement. After being placed with a private teacher, and working with their certificate advisor, students must confirm with that teacher the length and number of lessons they will receive.		16
MPNC 1102	Music Instruction	
MPNC 1103	Music Instruction	
MPNC 1104	Music Instruction	
Music Technology		
MPNC 1201	Contemporary Music Production and Technology 1	1
Electives		
Complete 7 credits from the following:		7
MPNC 1301	Build Your Voice: Art/Skillful Singing	
MPNC 1401	Jazz Ear Training 1	
MPNC 1411	Jazz Theory 1	
MPNC 1421	Finale Chart Writing	
MPNC 1451	Jazz History 1	
MPNC 1501	Introduction to Music-in-Education	
MPNC 1612	Group Piano Class	
MPNC 1621	The Art of Musical Sight-Reading	
MPNC 1622	The Art of Practice and Performance	
MPNC 1623	Developing Perfect Pitch 1	
MPNC 1631	The Accidental Music Teacher: From Musical Artist to Creative Educator	
MPNC 1642	Sight-Singing for Singers	
MPNC 1801	Introduction to Composition 1	
MPNC 1802	Contemporary Improvisation: Skill Building	
MPNC 1803	Contemporary Improvisation: Music of the World—The African Diaspora	
MPNC 1901	Art and Soul of Cinema: An Appreciation of Film Music	
MPNC 1911	Latin American Classical Traditions 1	
MPNC 2401	Jazz Ear Training 2	
MPNC 2411	Jazz Theory 2	
MPNC 2431	Jazz Composition and Analysis	
MPNC 2451	Jazz History 2	
MPNC 2511	Music-in-Education Seminar	
MPNC 2512	Models for Teaching and Learning for Music-in-Education	
MPNC 2525	Art and Science of Assessing Music Learning	
MPNC 2526	Music, Brain Development, and Learning	
MPNC 2547	Cross-Cultural Alternatives for Music-in-Education	
MPNC 2548	Teaching and Learning with Music Technology	
MPNC 2556	Improvisation in Music Education	
MPNC 2561	String Pedagogy	
MPNC 2571	Performing Artists in Schools	
MPNC 2601	Music Production for Media	
MPNC 2612	Piano Pedagogy	
MPNC 2623	Developing Perfect Pitch 2	
MPNC 2624	Advanced Perfect Pitch	
MPNC 2644	Bach/Handel Arias for Singers	
MPNC 2801	Introduction to Composition 2	
MPNC 2911	Latin American Classical Traditions 2	
MPNC 3401	Jazz Ear Training 3	
MPNC 3411	Jazz Theory 3	
MPNC 3431	Jazz Arranging	
MPNC 3611	Piano Interpretation/Performance Seminar	
MPNC 3631	18th-Century Tonal Counterpoint	
MPNC 3633	Modal Counterpoint	
MPNC 3641	Dramatic Coaching of Songs and Arias	
MPNC 3643	Vocal Repertoire: Coaching and Performance	
MPNC 3801	Composition Seminar 1	
MPNC 3802	Composition Seminar 2	
MPNC 4401	Jazz Ear Training 4	
MPNC 4411	Jazz Theory 4	
MPNC 4581	Music-in-Education Guided Internship	
MPNC 4591	Music-in-Education Portfolio	
Ensembles		
Complete two music ensembles:		2
MPNC 1712	Baroque Ensemble	
MPNC 1713	NEC Voices: A New Choral Experience	
MPNC 1714	Renaissance Ensemble	
MPNC 1716	Contemporary Improvisation Ensemble: Walking between Worlds	
MPNC 1721	Guitar Ensemble 1	
MPNC 1731	Jazz Ensemble	
MPNC 1741	Chamber Music Ensemble	
MPNC 1742	Chamber Music Duo	
MPNC 1751	Vocal Chamber Music	
MPNC 1771	Improvisation and Composition Ensemble	
MPNC 1781	Medieval Folk Roots Ensemble	
MPNC 3642	Opera Ensemble Skills	

Music Industry Leadership, JD/MS

Over the course of 45 months, the program enrolls students successively in the School of Law and the College of Arts, Media and Design. JD/MS candidates must complete the first and last years of the program in the School of Law. The year of music industry courses in the College of Arts, Media and Design may be taken during either the second or third year.

Program Requirements

Program Sequence

Year One

Fall and spring—traditional first-year law curriculum

Year Two

Summer—law co-op

Fall, winter, and spring—music industry courses (p. 58)

Year Three
Summer—music industry courses (p. 58)
Fall—law school courses
Winter—law co-op
Spring—law school courses

Year Four
Summer—law co-op
Fall—law school courses
Winter—law co-op
Spring—law school courses

D'Amore-McKim School of Business

Website (http://www.damore-mckim.northeastern.edu/grad)

Hugh G. Courtney, PhD, Dean

Peggy L. Fletcher, MBA, Associate Dean of Undergraduate Programs and Associate Dean of Finance and Administration
Kate E. Klepper, MBA, Associate Dean of Graduate Programs
Emery A. Trahan, PhD, Senior Associate Dean and Dean of Faculty
Mario J. Maletta, PhD, Senior Associate Dean of Academic Programs

D'Amore-McKim School of Business
350 Dodge Hall
617.373.5992
617.373.8564 (fax)
gsba@northeastern.edu

Graduate School of Professional Accounting
412 Dodge Hall
617.373.3244
617.373.8890 (fax)
gspa@northeastern.edu

Online Business Programs
175 Richards Hall
866.890.0347 x3510 (U.S. and Canada)
+1.617.476.3110 x3510 (International)
onlinegradbusiness@northeastern.edu

Graduate Certificate Programs
360 Huntington Ave., Building 236-502
617.373.3282
gradcertificates@northeastern.edu

Modern business faces many challenges from unprecedented political change and the effects of foreign policy, high technology, affirmative action regulations, and new economic policies. These challenges have increased the demand for highly trained individuals equipped to analyze and address our economy's complex social and legal problems.

Programs in the D'Amore-McKim School of Business (DMSB) are designed for students who are preparing to take on managerial responsibility. These programs seek to help students develop the ability to recognize and solve business and organizational problems and understand the role of business in the community, the nation, and the world. The college's goals are to help students develop ideals that are ethically sound and socially desirable; cultivate an awareness of the social, political, and economic developments to which businesses must adapt; develop sound judgment and effective communication skills; and develop their individual interests and talents.

Master of Science

Master of Science programs offer students the opportunity for in-depth study in a particular functional business area. Depending on a student's prior academic background, certain prerequisite courses of study may apply.

Designed for undergraduate accounting majors, the Master of Science in Accounting seeks to give you the advanced accounting knowledge and skills you need to sit for the CPA exam. No prior work experience is required.

With an MS in Taxation, you have an opportunity to learn to analyze the Internal Revenue Code, expand your professional network, and advance your career in taxation. Courses begin three times per year: in fall, spring, and summer.

Northeastern's MS in Finance program emphasizes the skills that are essential for a successful career in finance. You can pursue study in either corporate finance or investments.

Northeastern's MS in International Business (MSIB) is designed for globally focused individuals who want to begin careers in international business.

The Master of Science in Innovation is a one-year part-time cohort program for working professionals who want to dive into innovation as it applies to products, services, operations, and processes. The program is offered in two formats, 100% online with a May start and on campus with a September start.

The Master of Science in Technological Entrepreneurship is an intensive one-year (September to June) ten-course sequence that seeks to teach you the skills you need to know to effectively integrate technology and business.

Programs

Master of Science (MS)

- Innovation (p. 63)
- International Management (p. 64)
- Technological Entrepreneurship (p. 64)

Master of Science in Accounting (MSA)

- Accounting (p. 65)

Master of Science in Finance (MSF)

- Finance (p. 65)
- Finance—Evening/Part-Time Program (p. 66)
- Finance—Online Program (p. 66)

Master of Science in International Business (MSIB)

- International Business (p. 66)

Master of Science in Taxation (MST)

- Taxation (p. 67)
- Taxation—Online Program (p. 67)

Innovation, MS

The Master of Science in Innovation is a one-year, part-time program offered 100 percent online or on-campus and is designed specifically for working professionals who want to become innovation leaders. The 10-course program covers the fundamentals of innovation in business from multiple perspectives by using case studies and experiential innovation projects. The cohort-based Master of Science in Innovation starts in May

for online and in September for on-campus. The on-campus cohort meets primarily on Saturdays.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core

Complete one of the following:		3
On-campus only		
BUSN 6280	How Executives Shape and Lead Innovation and Enterprise Growth	
Online only		
ENTR 6225	Corporate Entrepreneurship through Global Growth, Acquisitions, and Alliances	

Required Course Work

Accounting and Finance		
ACCT 6280	Planning and Budgeting for Innovation	3
FINA 6284	Financing Innovation and Growth	3
Entrepreneurship		
ENTR 6217	Lean Innovation	3
ENTR 6222	Competing in Dynamic, Innovation-Driven Markets	3
Management		
HRMG 6280	The Human Side of Innovation	3
MGMT 6280	Innovation for Next-Generation Products and Systems	3
MGSC 6281	Service Innovation and Management	3
Marketing		
MKTG 6280	Gaining Customer Insight	3
MKTG 6283	Marketing and Selling Innovation	3

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

International Management, MS

In collaboration with the International Partnership of Business Schools (IPBS), the Master of Science in International Management (MIM) is designed to prepare students for careers in global economy. The MIM offers an opportunity to study in two continents, in two very different countries, with very different educational systems. Students who study for their first or second semesters at Northeastern University take the courses listed under the Program Requirements tab. Students who study at Northeastern University during the fall semester earn the Master of Science in International Management from the partner university where they study during their second semester. Students who study at Northeastern University during the spring semester earn the Northeastern University Master of Science in International Management. Learn more about the IPBS MIM program (http://www.ipbsmim.com).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

FALL SEMESTER

Required courses		
FINA 6209	Introduction to International Accounting and Finance	3
MGSC 6209	Business Statistics	3
Electives		
Complete three electives from the following:		9
INTB 6201	International Business Management	
MECN 6203	Global Managerial Economics	
MKTG 6206	International Marketing	
ENTR 6220	Family Business Leadership and Governance	
ENTR 6225	Corporate Entrepreneurship through Global Growth, Acquisitions, and Alliances	

SPRING SEMESTER

Required Courses		
FINA 6204	International Finance Management	3
INTB 6226	Becoming a Global Leader	3
INTB 6260	Advanced Topics in Global Management and Strategy	3
Electives		
Complete two electives from the following:		6
ENTR 6200	Enterprise Growth and Innovation	
STRT 6210	Workforce Metrics and Analytics	
SCHM 6213	Global Supply Chain Strategy	

Program Credit/GPA Requirements

30 total semester hours required
Minimum GPA 3.000 required

Technological Entrepreneurship, MS

The Master of Science in Technological Entrepreneurship is a 30-credit graduate degree program comprised of nine required courses and one graduate business elective course. Curriculum focuses on developing know-how to create new product lines and services from innovations, strong business models, go-to-market strategies, and business plans for investors. Students study how to segment customers, differentiate users and buyers, and delve into their respective needs. Curriculum will expose students to how to rapidly prototype designs and explore business models and construct financial projections. Students will be encouraged to participate in IDEA, our on-campus accelerator.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

Entrepreneurship		
ENTR 6200	Enterprise Growth and Innovation	3
ENTR 6212	Business Planning for New Ventures	3
ENTR 6218	Business Model Design and Innovation	3
ENTR 6219	Financing Ventures from Early Stage to Exit	3
Technology		

TECE 6222	Emerging and Disruptive Technologies	3
TECE 6230	Entrepreneurial Marketing and Selling	3
TECE 6250	Lean Design and Development	3
TECE 6300	Managing a Technology-Based Business	3
TECE 6340	The Technical Entrepreneur as Leader	3
Elective		
Complete 3 semester hours from the following subject areas:		3
ACCT, BUSN, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, STRT, or TECE		

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Accounting, MSA

The D'Amore-McKim MS in Accounting program for accounting majors is designed to prepare you with the advanced knowledge of accounting necessary to take the CPA exam. Our program is approved by the State Board of Accountancy in Massachusetts. No prior work experience is required, so you can get started as soon as you have completed your undergraduate degree.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

Accounting		
ACCT 6203	Business Entity Taxation	3
ACCT 6204	Financial Reporting for Integrated Multinational Enterprises	3
ACCT 6229	Accounting for Foreign Currency Transactions	1
Ethics		
ACCT 6253	Ethics in the Accounting Profession	3
Financial Reporting		
ACCT 6207	Contemporary and Emerging Issues in Financial Reporting	3
ACCT 6216	Financial Reporting for Governments and Nonprofit Entities	2

Tracks

Complete one of the following tracks:

AUDIT TRACK

Required Course Work		
ACCT 6205	Auditing in a Big Data Environment	3
ACCT 6217	Corporate Governance, Ethics, and Financial Reporting	3
ACCT 6254	Accounting Research and Communication	3
Electives		
Note: An alternative course may be substituted for one of the courses listed below with the approval of the program administrator.		
ACCT 5255	Forensic Accounting	3
ACCT 5256	Internal Auditing	3

TAXATION TRACK

Required Course Work		
ACCT 6231	Corporations and Shareholders	3
ACCT 6235	Partners and Partnerships	3
ACCT 6254	Accounting Research and Communication	3
Electives		
Complete 6 semester hours from the following:		6
Note: An alternative course may be substituted for one of the electives listed below with the approval of the program administrator.		
ACCT 6239	State and Local Taxation	
ACCT 6240	International Taxation: Inbound Transactions	
ACCT 6246	Retirement Plans	
ACCT 6248	Income Taxation of Trusts and Estates	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Finance, MSF

The Master of Science in Finance offers rigorous training in finance, helping you to develop your analytical and financial management skills. The curriculum is taught by faculty who are recognized as expert researchers by leading industry journals.

The full-time master's in finance is a 12-month program that has a strong emphasis on quantitative methods and finance theory. Students complete a lockstep curriculum together as a cohort, comprised of approximately 70 students, primarily international.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course Work		
FINA 6201	Financial Theory and Policy	3
FINA 6202	Analysis of Financial Institutions and Markets	3
FINA 6203	Investment Analysis	3
FINA 6204	International Finance Management	3
FINA 6205	Financial Strategy	3
FINA 6206	Finance Seminar	3
Electives		
Complete four electives (course offerings are at the discretion of the finance department):		12
FINA 6211	Financial Risk Management	
FINA 6212	Fixed Income Securities and Risk	
FINA 6214	Mergers and Acquisitions	
FINA 6217	Real Estate Finance and Investment	
FINA 6219	Portfolio Management	
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity	

FINA 6292	Advanced Topics in Finance	
Optional		
BUSN 6200	Career Management	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Finance—Evening/Part-Time Program, MSF

The Master of Science in Finance (MSF) is a 30-credit graduate degree program. The curriculum offers rigorous training in finance, helping you to develop your analytical and financial management skills, and is taught by faculty who are recognized as expert researchers by leading industry journals. Courses are offered in the evening to accommodate working professionals.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

FINA 6201	Financial Theory and Policy	3
FINA 6202	Analysis of Financial Institutions and Markets	3
FINA 6203	Investment Analysis	3
FINA 6204	International Finance Management	3
FINA 6205	Financial Strategy	3
FINA 6206	Finance Seminar	3

Electives

Finance Electives	
Complete 9 semester hours of FINA courses.	9
Business Elective	
Complete 3 semester hours in one of the following subject areas. Note that this course may be a finance course:	3
ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, or STRT	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Finance—Online Program, MSF

The practice-oriented curriculum of Northeastern University's Online Master of Science in Finance (OMSF) explores a comprehensive range of relevant financial topics. Designed to serve the needs of working professionals in the finance field, this 30-credit-hour program—which includes six core courses and four electives—can be completed entirely online in as few as 16 months. Students in the OMSF are classified as part-time and participate in one course at a time, completing core courses in the first year and capstone and elective courses in the second year.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

FINA 6201	Financial Theory and Policy	3
FINA 6202	Analysis of Financial Institutions and Markets	3
FINA 6203	Investment Analysis	3
FINA 6204	International Finance Management	3
FINA 6205	Financial Strategy	3
FINA 6206	Finance Seminar	3

Electives

Complete 12 semester hours in the following range:	12
FINA 6211 to FINA 6219	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

International Business, MSIB

The Master of Science in International Business is designed to expose talented, driven students to the global business environment that will distinguish them as they enter the workforce. This program, which can be completed in just one year of full-time study or two years of part-time study, offers the opportunity to learn in the heart of Boston, home to one of the largest, most vibrant, and highly regarded global marketplaces in the United States.

Successful graduates of this master's program will be culturally sensitive, with an international orientation, business acumen, and the analytic skills needed to best be prepared to navigate an increasingly interconnected and fast-paced world. You will have an opportunity to develop critical skills to handle the opportunities and challenges in organizations and businesses operating internationally.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

Core		
FINA 6204	International Finance Management	3
FINA 6209	Introduction to International Accounting and Finance	3
INTB 6200	Managing the Global Enterprise	3
INTB 6226	Becoming a Global Leader	3
MECN 6203	Global Managerial Economics	3
MKTG 6206	International Marketing	3
SCHM 6213	Global Supply Chain Strategy	3
International Field Study		
INTB 6230	International Field Study	3

Electives

Complete 6 semester hours from the following subject areas:	6
ACCT, BUSN, ENTR, FINARMG, INTSTRT, TECEB, MECN, MKTG, MGMT, MGSC, SCHM, Students may also consider political science or sociology courses.	

Program Credit/GPA Requirements

30 total semester hours required

Minimum 3.000 GPA required

Taxation, MST

The D'Amore-McKim MS in taxation program is designed with the working professional in mind. Courses begin three times per year: in fall, spring, and summer. The MST program is focused on teaching you to analyze the Internal Revenue Code. You can also expand your professional network by connecting with other tax professionals in Northeastern's alumni and corporate communities.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

ACCT 5230	Federal Tax Issues and Analysis	3
ACCT 5232	Estate and Gift Taxation	3
ACCT 6231	Corporations and Shareholders	3
ACCT 6233	Tax Research Methodology	1.5
ACCT 6234	Tax Practice, Procedure, and Ethics	1.5
ACCT 6235	Partners and Partnerships	3

Electives

Complete 15 semester hours from the following:		15
ACCT 6236	Reorganizations	
ACCT 6237	Consolidated Returns	
ACCT 6238	Income Tax Accounting	
ACCT 6239	State and Local Taxation	
ACCT 6240	International Taxation: Inbound Transactions	
ACCT 6241	International Taxation: Outbound Transactions	
ACCT 6242	Taxation of Financial Instruments	
ACCT 6243	Advanced Flow-Through Entities	
ACCT 6244	Tax Exempt Entities	
ACCT 6245	Strategic Tax Planning	
ACCT 6246	Retirement Plans	
ACCT 6247	Estate Planning	
ACCT 6248	Income Taxation of Trusts and Estates	
ACCT 6249	Financial Planning for Investments	
ACCT 6250	Financial Planning for Insurance	
ACCT 6251	Executive Compensation	
ACCT 6252	Taxation of E-Commerce	
ACCT 6262	Advanced Topics in Accounting	
ACCT 6264	Planning for Estate Tax Issues	
ACCT 6265	Tax Accounting for Income Taxes	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Taxation—Online Program, MST

Northeastern University's Online Master of Science in Taxation has been specifically designed and structured for working professionals like you. To accommodate your schedule, there are six start dates available throughout the year, so you can get started at your convenience. Students in the OMST are classified as part-time and participate in one course at a time, completing core courses in the first year and elective courses in the second year.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

ACCT 5230	Federal Tax Issues and Analysis	3
ACCT 5232	Estate and Gift Taxation	3
ACCT 6231	Corporations and Shareholders	3
ACCT 6235	Partners and Partnerships	3
ACCT 6292	Tax Research, Practice, and Ethics	3

Electives

Complete 15 semester hours from the following:		15
ACCT 6239	State and Local Taxation	
ACCT 6240	International Taxation: Inbound Transactions	
ACCT 6241	International Taxation: Outbound Transactions	
ACCT 6243	Advanced Flow-Through Entities	
ACCT 6246	Retirement Plans	
ACCT 6248	Income Taxation of Trusts and Estates	
ACCT 6249	Financial Planning for Investments	
ACCT 6250	Financial Planning for Insurance	
ACCT 6264	Planning for Estate Tax Issues	
ACCT 6265	Tax Accounting for Income Taxes	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Master of Business Administration

The D'Amore-McKim full-time MBA fully integrates world-class academics and meaningful business expertise, creating a powerful fusion that will inform you, inspire you, and fully connect you to the pulse of today's business world.

It happens in just 24 months.

Advantages of the D'Amore-McKim corporate residency:

- Six months of in-depth business experience
- Work as a paid employee at a leading business in your area of interest
- Significant responsibilities with critical projects
- Unparalleled experience that will build your confidence
- A lifetime of valuable connections
- Develop expertise required for meaningful full-time employment

Transform your life with firsthand knowledge of global business, enhanced leadership and communication skills, and the confidence to hit the ground running. It's waiting for you with the D'Amore-McKim full-time MBA.

The flexibility of our part-time MBA program allows you to complete your degree in as little as two or as long as seven years. You can commit

to courses just one night a week, or accelerate your degree by taking multiple classes that fit your schedule, including classes online and on Saturdays.

Beyond building a strong foundation of management and leadership skills, you can choose a concentration (http://www.damore-mckim.northeastern.edu/academic-programs/graduate-programs/mba/part-time/curriculum/concentrations)that meets your specific career objectives, such as marketing, corporate finance, investments, or supply chain management.

Earning your MBA from the D'Amore-McKim School of Business can help you build a strong peer-to-peer and alumni network to support you as an MBA student, in your current job, and throughout your career.

As a student in the online MBA program, you have an opportunity to build on your current career success, expand your managerial skills, and put new learning to use in your place of work. This program is offered completely online with no campus residency requirements; however, students can also elect to take certain elective courses on campus with program approval.

Programs

- MBA—Full-Time Program (p. 68)
- MBA—Evening/Part-Time Program (p. 70)
- MBA—Online Program (p. 73)

Business Administration, MBA—Full-Time Program

This is the MBA program unlike anything else out there.

The D'Amore-McKim full-time MBA fully integrates world-class academics and meaningful business expertise, creating a powerful fusion that will inform you, inspire you, and fully connect you to the pulse of today's business world.

It happens in just twenty-four months.

Advantages of the **D'Amore-McKim Corporate Residency:**

- Six months of in-depth business experience
- Work as a paid employee at a leading business in your area of interest
- Significant responsibilities with critical projects
- Unparalleled experience that will build your confidence
- A lifetime of valuable connections
- Develop expertise required for meaningful full-time employment

Transform your life with firsthand knowledge of global business, enhanced leadership and communication skills, and the confidence to hit the ground running. It's waiting for you with the D'Amore-McKim full-time MBA.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Term GPA Requirement

A GPA of 3.000 or higher is required at the end of each term.

Required Course Work

Fall Term		
Management		
BUSN 6200	Career Management	0
BUSN 6950	MBA Skills Workshop	0
MGSC 6205	Management of Information Resources	2
Financial Reporting		
ACCT 6208	Financial Reporting and Managerial Decision Making	4
Marketing		
MKTG 6208	Marketing and Customer Value	4
Economics		
MECN 6208	Economics for Managerial Decision Making	2
Human Resources		
HRMG 6208	Effective Organizational and Human Behavior	3
Spring Term		
Analysis		
MGSC 6207	Data Analysis for Decision Making	2
STRT 6208	Strategic Decisions for Growth	3
Management		
BUSN 6200	Career Management	0
ENTR 6208	Innovation and Enterprise Growth	2
FINA 6208	Financial Management for Value Creation	4
SCHM 6200	Supply Chain and Operations Management	4
Summer Term		
INTB 6238	Global Project	3
Term 4 or 5		
INTB 6208	Global Management	3
Electives		
Complete 9 semester hours from the following subject areas:		9
ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, STRT, and TECE		

Concentration Options

Complete one of the following concentrations:

- Entrepreneurship (p. 68)
- Healthcare management (p. 69)
- Finance—corporate or investment track (p. 69)
- Marketing (p. 69)
- Operations and supply chain management (p. 69)

CONCENTRATION IN ENTREPRENEURSHIP

Required Course Work		
ENTR 6212	Business Planning for New Ventures	3
Electives		
Complete 12 semester hours from the following:		12
ENTR 6214	Social Enterprise	
ENTR 6218	Business Model Design and Innovation	
ENTR 6219	Financing Ventures from Early Stage to Exit	
ENTR 6220	Family Business Leadership and Governance	
ENTR 6224	Intellectual Property and Other Legal Aspects of Business and Innovation	

ENTR 6225	Corporate Entrepreneurship through Global Growth, Acquisitions, and Alliances	
ENTR 6293	Design Thinking for Market-Driven Innovation	
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity	
HRMG 6212	Creating an Innovative Organization	
TECE 6222	Emerging and Disruptive Technologies	
TECE 6230	Entrepreneurial Marketing and Selling	
TECE 6300	Managing a Technology-Based Business	
TECE 6340	The Technical Entrepreneur as Leader	

CONCENTRATION IN HEALTHCARE MANAGEMENT

Required Course Work

FINA 6220	Healthcare Finance	3
HINF 5105	The American Healthcare System	3
HRMG 6220	Health Organization Management	3
SCHM 6223	Managing Healthcare Supply Chain Operations	3
STRT 6220	Strategic Management for Healthcare Organizations	3

Electives

Complete 9 semester hours from the following:		9
HINF 5101	Introduction to Health Informatics and Health Information Systems	
HINF 6202	Business of Healthcare Informatics	
HINF 6205	Creation and Application of Medical Knowledge	
PHTH 5232	Evaluating Healthcare Quality	

CONCENTRATION IN MARKETING

Required Course Work

MKTG 6210	Marketing Research	3

Electives

Complete 12 semester hours from the following:		12
MKTG 6212	International Marketing	
MKTG 6214	New Product Development	
or TECE 6250	Lean Design and Development	
MKTG 6216	Market Focused Strategy	
MKTG 6218	Marketing in Service Sector	
MKTG 6222	Digital Marketing	
MKTG 6223	Brand and Advertising Management	
MKTG 6224	B2B and Strategic Sales	
MKTG 6226	Consumer Behavior	
MKTG 6260	Special Topics in Marketing	
ENTR 6224	Intellectual Property and Other Legal Aspects of Business and Innovation	

CONCENTRATION IN FINANCE

Required Course Work

FINA 6203	Investment Analysis	3

Track

Complete one of the following two tracks:		12
Corporate Finance Track		
Complete 3 semester hours from the following:		
FINA 6205	*Financial Strategy*	
FINA 6216	Valuation and Value Creation	
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity	
Complete 9 semester hours from the following:		9
FINA 6204	International Finance Management	
FINA 6205	Financial Strategy	
FINA 6211	Financial Risk Management	
FINA 6213	Investment Banking	
FINA 6214	Mergers and Acquisitions	
FINA 6215	Business Turnarounds	
FINA 6216	Valuation and Value Creation	
FINA 6217	Real Estate Finance and Investment	
FINA 6220	Healthcare Finance	
FINA 6221	Entrepreneurial Finance	
FINA 6222	Risk Management and Insurance	
FINA 6231	Disrupting the Finance and Insurance Service Industries	
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity	
Investments Track		
Complete 3 semester hours from the following:		
FINA 6211	Financial Risk Management	
FINA 6219	Portfolio Management	
Complete 9 semester hours from the following:		9
FINA 6204	International Finance Management	
FINA 6211	Financial Risk Management	
FINA 6213	Investment Banking	
FINA 6214	Mergers and Acquisitions	
FINA 6216	Valuation and Value Creation	
FINA 6217	Real Estate Finance and Investment	
FINA 6219	Portfolio Management	
FINA 6231	Disrupting the Finance and Insurance Service Industries	
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity	
FINA 6360	Fund Management for Analysts	
FINA 6361	Fund Management for Managers	

CONCENTRATION IN OPERATIONS AND SUPPLY CHAIN MANAGEMENT

Required Course Work

SCHM 6213	Global Supply Chain Strategy	3

Electives

Complete 12 semester hours from the following:		12
SCHM 6211	Logistics and Transportation Management	
SCHM 6212	Executive Roundtable in Supply Chain Management	
SCHM 6214	Sourcing and Procurement	
SCHM 6215	Supply Chain Analytics	
SCHM 6216	Market-Driven Supply Chains	
SCHM 6218	Offshore Outsourcing	
SCHM 6221	Sustainability and Supply Chain Management	
SCHM 6222	Managing Emerging Issues in Supply Chain Management	

SCHM 6223	Managing Healthcare Supply Chain Operations	
SCHM 6224	Demand Planning and Forecasting	
MGMT 6214	Negotiations	
ENTR 6224	Intellectual Property and Other Legal Aspects of Business and Innovation	

Program Credit/GPA Requirements

60 total semester hours required
Minimum 3.000 GPA required

Business Administration, MBA—Evening/Part-Time Program

The flexibility of D'Amore-McKim's part-time MBA program allows students to complete their degree in as little as two or as long as seven years. Students can commit to courses just one night a week or accelerate their studies by taking multiple classes that fit individual schedules, including classes online and on Saturdays.

Beyond building a strong foundation of management and leadership skills, students can choose a concentration that meets their specific career objectives, such as marketing,corporate finance, investments, or supply chain management.

Earning an MBA from the D'Amore-McKim School of Business can help you build a strong peer-to-peer and alumni network to support you as an MBA student, in your current job, and throughout your career. Learn more about the student and alumni experience (http://www.damore-mckim.northeastern.edu/academic-programs/graduate-programs/mba/part-time/student-experiences).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

Accounting		
ACCT 6200	Financial Reporting and Managerial Decision Making 1	3
ACCT 6201	Financial Reporting and Managerial Decision Making 2	1.5
Management		
HRMG 6200	Managing People and Organizations	3
INTB 6200	Managing the Global Enterprise	3
MGSC 6204	Managing Information Resources	1.5
SCHM 6210	Supply Chain Management	3
Marketing		
MKTG 6200	Creating and Sustaining Customer Markets	3
MECN 6200	Global Competition and Market Dominance	3
Analysis		
FINA 6200	Value Creation through Financial Decision Making	3
MGSC 6200	Information Analysis	3
STRT 6200	Strategic Decision Making in a Changing Environment	3
Entrepreneurship		
ENTR 6200	Enterprise Growth and Innovation	3
Electives		
Note: students may opt to take an additional concentration in lieu of elective coursework		15-18

Concentration Options

This major requires a concentration. Complete one of the following concentrations:

- Corporate finance (p. 70)
- Corporate renewal (p. 71)
- Entrepreneurship (p. 71)
- Healthcare management (p. 71)
- International business (p. 71)
- Investments (p. 71)
- Marketing (p. 70)
- Mutual fund management (p. 72)
- Supply chain management (p. 70)
- Technical entrepreneurship (p. 71)

Consult your college administrator for more information.

CONCENTRATION IN CORPORATE FINANCE

Required Course Work

FINA 6205	Financial Strategy	3
FINA 6200	Value Creation through Financial Decision Making	3
Restricted Electives		
Complete two of the following:		6
FINA 6204	International Finance Management	
FINA 6213	Investment Banking	
FINA 6214	Mergers and Acquisitions	
FINA 6215	Business Turnarounds	
FINA 6216	Valuation and Value Creation	
FINA 6221	Entrepreneurial Finance	
FINA 6222	Risk Management and Insurance	
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity	

CONCENTRATION IN MARKETING

Required Course Work

MKTG 6200	Creating and Sustaining Customer Markets	3
Restricted Electives		
Complete three of the following:		9
MKTG 6210	Marketing Research	
MKTG 6212	International Marketing	
MKTG 6214	New Product Development	
MKTG 6216	Market Focused Strategy	
MKTG 6218	Marketing in Service Sector	
MKTG 6222	Digital Marketing	
MKTG 6223	Brand and Advertising Management	
MKTG 6224	B2B and Strategic Sales	
MKTG 6226	Consumer Behavior	
MKTG 6260	Special Topics in Marketing	

CONCENTRATION IN SUPPLY CHAIN MANAGEMENT

Restricted Electives

Complete three of the following:		9

SCHM 6211	Logistics and Transportation Management	
SCHM 6212	Executive Roundtable in Supply Chain Management	
or SCHM 6222	Managing Emerging Issues in Supply Chain Management	
SCHM 6213	Global Supply Chain Strategy	
SCHM 6214	Sourcing and Procurement	
SCHM 6215	Supply Chain Analytics	
SCHM 6221	Sustainability and Supply Chain Management	
SCHM 6223	Managing Healthcare Supply Chain Operations	
SCHM 6224	Demand Planning and Forecasting	

CONCENTRATION IN HEALTHCARE MANAGEMENT

Required Course Work

HINF 5105	The American Healthcare System	3
STRT 6220	Strategic Management for Healthcare Organizations	3
HRMG 6220	Health Organization Management	3

Restricted Elective

Complete one of the following:		3
PHTH 5234	Economic Perspectives on Health Policy	
PHTH 5232	Evaluating Healthcare Quality	
HINF 5101	Introduction to Health Informatics and Health Information Systems	
SCHM 6223	Managing Healthcare Supply Chain Operations	

CONCENTRATION IN INVESTMENTS

Required Course Work

FINA 6200	Value Creation through Financial Decision Making	3
FINA 6203	Investment Analysis	3

Restricted Electives

Complete two of the following:		6
FINA 6211	Financial Risk Management	
FINA 6212	Fixed Income Securities and Risk	
FINA 6213	Investment Banking	
FINA 6217	Real Estate Finance and Investment	
FINA 6218	Personal Financial Planning	
FINA 6219	Portfolio Management	
FINA 6222	Risk Management and Insurance	
FINA 6292	Advanced Topics in Finance	

CONCENTRATION IN CORPORATE RENEWAL

Required Course Work

FINA 6200	Value Creation through Financial Decision Making	3

Restricted Electives

Complete three of the following:		9
ENTR 6214	Social Enterprise	
ENTR 6224	Intellectual Property and Other Legal Aspects of Business and Innovation	
FINA 6215	Business Turnarounds	
FINA 6216	Valuation and Value Creation	
HRMG 6212	Creating an Innovative Organization	
HRMG 6213	Leadership	
HRMG 6218	Great Companies	
MGMT 6210	Law for Managers and Entrepreneurs	
MGMT 6214	Negotiations	
MKTG 6216	Market Focused Strategy	

CONCENTRATION IN INTERNATIONAL BUSINESS

Required Course Work

INTB 6200	Managing the Global Enterprise	3
INTB 6212	Cultural Aspects of International Business	3

Restricted Electives

Complete two of the following:		6
ENTR 6225	Corporate Entrepreneurship through Global Growth, Acquisitions, and Alliances	
FINA 6204	International Finance Management	
INTB 6217	Creating Sustainable Competitive Advantage through Global Innovation	
INTB 6226	Becoming a Global Leader	
INTB 6230	International Field Study	
INTB 6232	Doing Business in Emerging Markets	
MKTG 6212	International Marketing	
SCHM 6213	Global Supply Chain Strategy	

CONCENTRATION IN ENTREPRENEURSHIP

Required Course Work

ENTR 6200	Enterprise Growth and Innovation	3

Restricted Electives

Complete three of the following:		9
ENTR 6212	Business Planning for New Ventures	
ENTR 6214	Social Enterprise	
ENTR 6218	Business Model Design and Innovation	
ENTR 6219	Financing Ventures from Early Stage to Exit	
ENTR 6220	Family Business Leadership and Governance	
ENTR 6222	Competing in Dynamic, Innovation-Driven Markets	
ENTR 6223	Cross-Cultural Innovation Management	
ENTR 6225	Corporate Entrepreneurship through Global Growth, Acquisitions, and Alliances	
ENTR 6293	Design Thinking for Market-Driven Innovation	
MGMT 6210	Law for Managers and Entrepreneurs	
MKTG 6214	New Product Development	
TECE 6300	Managing a Technology-Based Business	

CONCENTRATION IN TECHNICAL ENTREPRENEURSHIP

Required Course Work

ENTR 6200	Enterprise Growth and Innovation	3

Restricted Electives

Complete three of the following:		9

ENTR 6212	Business Planning for New Ventures
ENTR 6222	Competing in Dynamic, Innovation-Driven Markets
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity
TECE 6222	Emerging and Disruptive Technologies
TECE 6240	Finance For Technology-Based Entrepreneurial Firms
TECE 6250	Lean Design and Development
TECE 6300	Managing a Technology-Based Business
TECE 6340	The Technical Entrepreneur as Leader

CONCENTRATION IN MUTUAL FUND MANAGEMENT

Required Course Work

FINA 6200	Value Creation through Financial Decision Making	3
FINA 6203	Investment Analysis	3
FINA 6219	Portfolio Management	3

Restricted Elective

Complete 3 semester hours of restricted electives. At least one credit must be from FINA 6361		3
FINA 6360	Fund Management for Analysts	
or FINA 6361	Fund Management for Managers	

Electives

Marketing

MKTG 6210	Marketing Research
MKTG 6212	International Marketing
MKTG 6214	New Product Development
MKTG 6216	Market Focused Strategy
MKTG 6218	Marketing in Service Sector
MKTG 6222	Digital Marketing
MKTG 6223	Brand and Advertising Management
MKTG 6224	B2B and Strategic Sales
MKTG 6226	Consumer Behavior
MKTG 6260	Special Topics in Marketing

Finance Group A

FINA 6203	Investment Analysis
FINA 6204	International Finance Management
FINA 6211	Financial Risk Management
FINA 6212	Fixed Income Securities and Risk
FINA 6213	Investment Banking
FINA 6217	Real Estate Finance and Investment
FINA 6218	Personal Financial Planning
FINA 6219	Portfolio Management
FINA 6222	Risk Management and Insurance

Finance Group B

FINA 6205	Financial Strategy
FINA 6204	International Finance Management
FINA 6213	Investment Banking
FINA 6214	Mergers and Acquisitions
FINA 6215	Business Turnarounds
FINA 6216	Valuation and Value Creation
FINA 6221	Entrepreneurial Finance
FINA 6222	Risk Management and Insurance
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity

Supply Chain Management

SCHM 6211	Logistics and Transportation Management
SCHM 6212	Executive Roundtable in Supply Chain Management
or SCHM 6222	Managing Emerging Issues in Supply Chain Management
SCHM 6213	Global Supply Chain Strategy
SCHM 6214	Sourcing and Procurement
SCHM 6215	Supply Chain Analytics
SCHM 6221	Sustainability and Supply Chain Management
SCHM 6223	Managing Healthcare Supply Chain Operations

Entrepreneurship

ENTR 6212	Business Planning for New Ventures
ENTR 6214	Social Enterprise
ENTR 6218	Business Model Design and Innovation
ENTR 6219	Financing Ventures from Early Stage to Exit
ENTR 6220	Family Business Leadership and Governance
ENTR 6222	Competing in Dynamic, Innovation-Driven Markets
ENTR 6223	Cross-Cultural Innovation Management
ENTR 6293	Design Thinking for Market-Driven Innovation
MGMT 6210	Law for Managers and Entrepreneurs
MKTG 6214	New Product Development
TECE 6300	Managing a Technology-Based Business

Technical Entrepreneurship

TECE 6222	Emerging and Disruptive Technologies
TECE 6230	Entrepreneurial Marketing and Selling
TECE 6250	Lean Design and Development
TECE 6300	Managing a Technology-Based Business
TECE 6340	The Technical Entrepreneur as Leader
ENTR 6212	Business Planning for New Ventures
ENTR 6222	Competing in Dynamic, Innovation-Driven Markets
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity

Healthcare

HINF 5105	The American Healthcare System
HRMG 6220	Health Organization Management
STRT 6220	Strategic Management for Healthcare Organizations
HINF 5101	Introduction to Health Informatics and Health Information Systems
PHTH 5232	Evaluating Healthcare Quality
PHTH 5234	Economic Perspectives on Health Policy

SCHM 6223	Managing Healthcare Supply Chain Operations
Mutual Fund Management	
FINA 6203	Investment Analysis
FINA 6219	Portfolio Management
FINA 6360	Fund Management for Analysts
FINA 6361	Fund Management for Managers
International Business	
INTB 6212	Cultural Aspects of International Business
FINA 6204	International Finance Management
INTB 6217	Creating Sustainable Competitive Advantage through Global Innovation
INTB 6226	Becoming a Global Leader
INTB 6230	International Field Study
MKTG 6212	International Marketing
SCHM 6213	Global Supply Chain Strategy
Corporate Renewal	
ENTR 6214	Social Enterprise
FINA 6215	Business Turnarounds
FINA 6216	Valuation and Value Creation
HRMG 6212	Creating an Innovative Organization
HRMG 6213	Leadership
HRMG 6218	Great Companies
MGMT 6214	Negotiations
MKTG 6214	New Product Development
MKTG 6216	Market Focused Strategy

Program Credit/GPA Requirements

60 total semester hours required
Minimum 3.000 GPA required

Business Administration, MBA—Online Program

The Northeastern University Online MBA (OMBA) is a fully online program with no campus residency requirements. Students may enter the program at one of nine start dates per academic year. By adhering to a schedule established at the semester of entry, the program may be completed in as little as two years. Students in the OMBA are classified as part-time and participate in one course at a time, completing core courses in the first year and capstone and elective courses in the second year.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

Accounting		
ACCT 6272	Financial Statement Preparation and Analysis	2.25
ACCT 6273	Identifying Strategic Implications in Accounting Data	2.25
Management		
HRMG 6200	Managing People and Organizations	3
INTB 6200	Managing the Global Enterprise	3
MGSC 6204	Managing Information Resources	1.5
MGSC 6206	Management of Service and Manufacturing Operations	3
MGMT 6213	Managing Ethics in the Workplace and Marketplace	2
Marketing		
MKTG 6200	Creating and Sustaining Customer Markets	3
MECN 6200	Global Competition and Market Dominance	3
Analysis		
FINA 6200	Value Creation through Financial Decision Making	3
MGSC 6200	Information Analysis	3
STRT 6200	Strategic Decision Making in a Changing Environment	3
Entrepreneurship		
ENTR 6200	Enterprise Growth and Innovation	3
Electives		
Choose 15 semester hours from the following subject areas:		15
ENTR, FINA, HRMG, INTB, MKTG, MGMT, MGSC, SCHM		

Concentration Options

- Finance (p. 73)
- Healthcare management (p. 73)
- High-technology management (p. 73)
- Innovation entrepreneurship (p. 74)
- International management (p. 74)
- Marketing (p. 74)
- Operations and supply chain management (p. 74)
- Sustainability (p. 74)

CONCENTRATION IN FINANCE

Choose 9 semester hours from the following:		9
FINA 6203	Investment Analysis	
FINA 6204	International Finance Management	
FINA 6205	Financial Strategy	
FINA 6213	Investment Banking	
FINA 6214	Mergers and Acquisitions	
FINA 6215	Business Turnarounds	
FINA 6216	Valuation and Value Creation	
FINA 6220	Healthcare Finance	
FINA 6225	Entrepreneurial Finance for High Tech Companies	
MECN 6205	Sustainability and the Economics of Markets	

CONCENTRATION IN HEALTHCARE MANAGEMENT

Choose 9 semester hours from the following:		9
FINA 6220	Healthcare Finance	
MGSC 6221	Introduction to Health Informatics and Health Information Systems	
MGMT 6222	Healthcare Industry	
MGMT 6223	Strategic Decision Making for Healthcare Professionals	

CONCENTRATION IN HIGH-TECHNOLOGY MANAGEMENT

Choose 9 semester hours from the following: 9

FINA 6225	Entrepreneurial Finance for High Tech Companies
HRMG 6217	Virtual, Vicious Teams: Building and Leading High-Performance Teams
MGMT 6283	Business Law, Corporate Governance, and Intellectual Property Strategies

CONCENTRATION IN INNOVATION ENTREPRENEURSHIP

Choose 9 semester hours from the following: 9

ENTR 6210	Managing Operations in Early Stage Ventures
ENTR 6211	Entrepreneurship: Services and Retail Business Creation
ENTR 6212	Business Planning for New Ventures
ENTR 6216	Global Social Entrepreneurship and Innovation
FINA 6225	Entrepreneurial Finance for High Tech Companies
MKTG 6214	New Product Development

CONCENTRATION IN INTERNATIONAL MANAGEMENT

Choose 9 semester hours from the following: 9

ENTR 6216	Global Social Entrepreneurship and Innovation
INTB 6212	Cultural Aspects of International Business
INTB 6217	Creating Sustainable Competitive Advantage through Global Innovation
FINA 6204	International Finance Management
MKTG 6212	International Marketing
SCHM 6213	Global Supply Chain Strategy

CONCENTRATION IN MARKETING

Choose 9 semester hours from the following: 9

MKTG 6210	Marketing Research
MKTG 6212	International Marketing
MKTG 6214	New Product Development
MKTG 6216	Market Focused Strategy
MKTG 6218	Marketing in Service Sector
MKTG 6222	Digital Marketing
MKTG 6223	Brand and Advertising Management
MKTG 6225	Sustainability and Innovation in Product Design

CONCENTRATION IN OPERATIONS AND SUPPLY CHAIN MANAGEMENT

Choose 9 semester hours from the following: 9

SCHM 6210	Supply Chain Management
SCHM 6211	Logistics and Transportation Management
SCHM 6213	Global Supply Chain Strategy
SCHM 6214	Sourcing and Procurement
SCHM 6220	Growing and Protecting Business Value through the Supply Chain
SCHM 6221	Sustainability and Supply Chain Management

CONCENTRATION IN SUSTAINABILITY

Choose 9 semester hours from the following: 9

MECN 6205	Sustainability and the Economics of Markets
MGMT 6225	Sustainability and Leadership
MGMT 6226	Sustainability and the Business Environment
MKTG 6225	Sustainability and Innovation in Product Design
SCHM 6221	Sustainability and Supply Chain Management

Program Credit/GPA Requirements

50 total semester hours required
Minimum 3.000 GPA required

Dual Degrees

With an MSA/MBA from Northeastern, you can earn two degrees—an Master of Science in Accounting (MS) and a Master of Business Administration (MBA)—in just 15 months. This program is designed for liberal arts, nonaccounting majors. The program includes a 3-month, paid internship that may lead to full-time placement in public accounting upon completion.

The Master of Science in Finance/MBA (MSF/MBA) program is open to students admitted to the full-time MBA program, the evening MBA program, the online MBA program, or the MS in finance program.

Northeastern's School of Nursing and D'Amore-McKim School of Business offer the MS/MBA in nursing program, linking graduate-level management education with specific clinical and organizational issues relevant to nurse managers. The MS/MBA program seeks to provide students with the knowledge, skills, and attitudes necessary to understand, shape, and respond to the dynamic forces at play in today's healthcare environment.

The JD/MBA is a powerful combination that seeks to equip candidates to operate with equal facility in the increasingly interdependent legal and business spheres. Northeastern University offers an accelerated 45-month program in which students concurrently earn an MBA through the D'Amore-McKim School of Business and a JD through the School of Law. Northeastern's dynamic co-op program gives students hands-on experience in combining the legal and business worlds.

Programs

- MS/MBA—Nursing and Business Administration (p. 74)
- MSA/MBA—Professional Accounting Program (p. 74)
- MSF/MBA—Full-Time Program (p. 75)
- MSF/MBA—Evening/Part-Time Program (p. 76)
- MSF/MBA—Online Program (p. 77)
- JD/MBA (p. 77)

MS/MBA—Nursing and Business Administration

See Bouvé College of Health Sciences Nursing MS/MBA program (p. 242) for curriculum information.

MSA/MBA—Professional Accounting Program

With an MSA/MBA from the D'Amore-McKim School of Business, you earn two degrees—an MS in Accounting and an MBA—in just fifteen

months. Our full-time program is specifically designed to get liberal arts and nonaccounting majors CPA ready.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Program Requirements

TERM 1—SUMMER A

Corporate Reporting 1		
ACCT 6220	Corporate Financial Reporting and Decision Making 1	3
Management		
HRMG 6200	Managing People and Organizations	3

TERM 1—SUMMER B

Corporate Reporting 2		
ACCT 6221	Corporate Financial Reporting and Decision Making 2	6
Global Competition		
MECN 6200	Global Competition and Market Dominance	3
Information Analysis		
MGSC 6200	Information Analysis	3
Summer Term GPA Requirement		
A GPA of 2.500 or higher is required at the end of term 1.		

Term 2—Fall

Corporate Government		
ACCT 6217	Corporate Governance, Ethics, and Financial Reporting	3
ACCT 6222	Corporate and Governmental/Nonprofit Financial Reporting and Decision Making	6
Audit		
ACCT 6223	Audit and Other Assurance Services	6
Taxation		
ACCT 6224	Taxation of Individuals and Business Entities	6
Information Systems		
MGSC 6201	Information Systems and Technology	3
Fall Term GPA Requirement		
A GPA of 2.670 or higher is required at the end of term 2.		

TERM 3—SPRING

Internship		
BUSN 6964	Co-op Work Experience	0
Cost Management		
ACCT 6226	Strategic Cost Management	3
Service and Manufacturing Operations		
SCHM 6210	Supply Chain Management	3
Spring Term GPA Requirement		
A GPA of 2.830 or higher is required at the end of term 3.		

TERM 4—SUMMER A

Accounting		
ACCT 6227	Accounting for Business Combinations	3
Entrepreneurship		
ENTR 6211	Entrepreneurship: Services and Retail Business Creation	3
Financial Decision Making		
FINA 6200	Value Creation through Financial Decision Making	3
Customer Markets		
MKTG 6200	Creating and Sustaining Customer Markets	3

TERM 4—SUMMER B

Accounting		
ACCT 6228	Contemporary Issues in Accounting Theory	3
Business Law and Ethics		
MGMT 6211	Business Law and Professional Ethics	3
Global Enterprise		
INTB 6200	Managing the Global Enterprise	3
Strategic Decision Making		
STRT 6200	Strategic Decision Making in a Changing Environment	3

Program Credit/GPA Requirements

72 total semester hours required
Minimum 3.000 GPA required

MSF/MBA—Full-Time Program

Students may be admitted to the MSF/MBA program at the point of their initial enrollment in the D'Amore-McKim School of Business or may petition to change into the MSF/MBA program from either the MBA or the MSF programs. The MSF/MBA program requires 72 semester hours vs.90 semester hours to earn the two degrees separately (MBA requires 60 semester hours, MSF requires 30 semester hours). Once either the MBA or the MSF has been awarded, it is not possible to apply for the joint degree.

The MSF/MBA program requirement of 72 semester hours consists of all the required courses in the full-time MBA program or the part-time MBA program, four of the six required courses in the MSF program, and electives.

Students may receive waiver and/or transfer credit of up to 20 semester hours (transfer credit is limited to 9 semester hours). A grade-point average of 3.000 is required for graduation.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Term 1—Fall

Management		
BUSN 6200	Career Management	0
MGSC 6205	Management of Information Resources	2
BUSN 6950	MBA Skills Workshop	0
Financial Reporting		
ACCT 6208	Financial Reporting and Managerial Decision Making	4
Marketing		
MKTG 6208	Marketing and Customer Value	4
Economics		

MECN 6208	Economics for Managerial Decision Making	2
Human Resources		
HRMG 6208	Effective Organizational and Human Behavior	3
Term 1 GPA Requirement		
A GPA of 3.000 or higher is required at the end of term 1.		

Term 2—Spring

Analysis		
MGSC 6207	Data Analysis for Decision Making	2
STRT 6208	Strategic Decisions for Growth	3
Management		
BUSN 6200	Career Management	0
ENTR 6208	Innovation and Enterprise Growth	2
FINA 6208	Financial Management for Value Creation	4
SCHM 6200	Supply Chain and Operations Management	4
Term 2 GPA Requirement		
A GPA of 3.000 or higher is required at the end of term 2.		

Additional Required Core Courses

Finance Core Courses		
FINA 6203	Investment Analysis	3
FINA 6204	International Finance Management	3
FINA 6205	Financial Strategy	3
FINA 6206	Finance Seminar	3
Global Project Course		
INTB 6238	Global Project	3
Management		
INTB 6208	Global Management	3

Electives

Finance Electives		
Complete 12 semester hours of FINA courses.		12
Business Electives		
Complete 12 semester hours in the following subject areas. Note that these courses may be finance courses:		12
ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, STRT, and TECE		

Program Credit/GPA Requirements

72 total semester hours required
Minimum 3.000 GPA required

MSF/MBA—Evening/Part-Time Program

Students may be admitted to the MSF/MBA program at the point of their initial enrollment in the D'Amore-McKim School of Business or may petition to change into the MSF/MBA program from either the MBA or the MSF programs. The MSF/MBA program requires 72 credits vs.90 to earn the two degrees separately (MBA requires 60 credits and MSF requires 30 credits). Once either the MBA or the MSF has been awarded, it is not possible to apply for the joint degree.

The MSF/MBA program requirement of 72 credits consists of all the required courses in the part-time MBA program, four of the six required courses in the MSF program, and electives.

Students may receive waiver and/or transfer credit of up to 20 credits (transfer credit is limited to 9 credits). A grade-point average of 3.000 is required for graduation.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

Accounting		
ACCT 6200	Financial Reporting and Managerial Decision Making 1	3
ACCT 6201	Financial Reporting and Managerial Decision Making 2	1.5
Management		
HRMG 6200	Managing People and Organizations	3
INTB 6200	Managing the Global Enterprise	3
MGSC 6204	Managing Information Resources	1.5
SCHM 6210	Supply Chain Management	3
Marketing		
MKTG 6200	Creating and Sustaining Customer Markets	3
MECN 6200	Global Competition and Market Dominance	3
Analysis		
FINA 6200	Value Creation through Financial Decision Making	3
MGSC 6200	Information Analysis	3
STRT 6200	Strategic Decision Making in a Changing Environment	3
Entrepreneurship		
ENTR 6200	Enterprise Growth and Innovation	3
Additional Required Finance Courses		
FINA 6203	Investment Analysis	3
FINA 6204	International Finance Management	3
FINA 6205	Financial Strategy	3
FINA 6206	Finance Seminar	3

Electives

Finance Electives		
Complete 12 semester hours of FINA courses.		12
Business Electives		
Complete 15 semester hours of courses from the following subject areas. Note that these courses may include finance courses:		15
ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, and STRT		

Program Credit/GPA Requirements

72 total semester hours required
Minimum 3.000 GPA required

MSF/MBA—Online Program

Our dual Master of Science in Finance/MBA (MSF/MBA) program, offered in a convenient online format, is designed to help you develop your managerial potential and practical finance skills in key areas such as valuation, mergers and acquisitions, risk management, insurance, and investments. The online program (OMBA/OMSF) is available to second-year online MBA students who have achieved a minimum of a 3.000 grade-point average and a B grade in Financial Statement Preparation and Analysis (ACCT 6272), Identifying Strategic Implications in Accounting Data (ACCT 6273), and Value Creation through Financial Decision Making (FINA 6200). Students may apply to the dual program at any point during their second year. The OMBA/OMSF can be completed in as little as three years. The dual degree is listed on both the transcript and the diploma.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

ACCT 6272	Financial Statement Preparation and Analysis	2.25
ACCT 6273	Identifying Strategic Implications in Accounting Data	2.25
HRMG 6200	Managing People and Organizations	3
INTB 6200	Managing the Global Enterprise	3
MGMT 6213	Managing Ethics in the Workplace and Marketplace	2
MGSC 6204	Managing Information Resources	1.5
MGSC 6206	Management of Service and Manufacturing Operations	3
MKTG 6200	Creating and Sustaining Customer Markets	3
MECN 6200	Global Competition and Market Dominance	3
FINA 6200	Value Creation through Financial Decision Making	3
FINA 6203	Investment Analysis	3
FINA 6204	International Finance Management	3
FINA 6205	Financial Strategy	3
MGSC 6200	Information Analysis	3
STRT 6200	Strategic Decision Making in a Changing Environment	3
ENTR 6200	Enterprise Growth and Innovation	3
FINA 6206	Finance Seminar	3

Electives

Finance Electives	
Complete 9 semester hours of finance electives.	9
Business Electives	
Complete 6 semester hours in the following subject areas. Note that these courses may include finance courses:	6
MGSC, ENTR, FINA, HRMG, MKTG, MGMT, SCHM, SUST	

Program Credit/GPA Requirements

62 total semester hours required
Minimum 3.000 GPA required

JD/MBA

The JD/MBA program offers students an opportunity to obtain both the JD and MBA degrees in a full-time, four-year course of study, which includes four one-quarter co-op work experiences arranged through the law school co-op office. Starting in the fall term, students are enrolled in the School of Law for a total of three years and the D'Amore-McKim School of Business for one year. JD/MBA candidates complete three years of law school, taking a break after either year one or year two to complete one year of business school. Information detailing the three years of JD course work and co-op is available at the School of Law (http://www.northeastern.edu/law/academics/curriculum/dual-degrees/jdmba.html) website.

The course work for the MBA year consists of 49 semester credits, comprised of the established program plan for the first two semesters of the full-time MBA program (30 credits) with some changes in the program schedule. During spring semester, students will take one additional 3-credit elective. During summer, students will take Managing the Global Enterprise (INTB 6200), along with 13 credits of MBA electives.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

MBA Program Requirements

Concurrent degree candidates follow a set schedule, as follows:

FALL TERM

Management		
MGSC 6205	Management of Information Resources	2
Financial Reporting		
ACCT 6208	Financial Reporting and Managerial Decision Making	4
Marketing		
MKTG 6208	Marketing and Customer Value	4
Economics		
MECN 6208	Economics for Managerial Decision Making	2
Human Resources		
HRMG 6208	Effective Organizational and Human Behavior	3

SPRING TERM

Analysis		
MGSC 6207	Data Analysis for Decision Making	2
STRT 6208	Strategic Decisions for Growth	3
Management		
ENTR 6208	Innovation and Enterprise Growth	2
FINA 6208	Financial Management for Value Creation	4
SCHM 6200	Supply Chain and Operations Management	4
Elective		
Complete 3 semester hours of course work from the following subject areas:		3
ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, STRT, and TECE		

SUMMER TERM

INTB 6200	Managing the Global Enterprise	3

ELECTIVES

Complete 13 semester hours from the following subject areas:	13
ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, STRT, and TECE	

Program Credit/GPA Requirements

49 total semester hours required
Minimum 3.000 GPA required

Graduate Certificate Programs

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions.

Courses completed with a GPA of 3.000 or better may be applied toward a master's degree at Northeastern.

Programs

- Accounting and Financial Decision Making (p. 78)
- Accounting and Financial Decision Making—Online Program (p. 78)
- Business Administration (p. 79)
- Business Administration—Online Program (p. 79)
- Corporate Finance (p. 80)
- Corporate Finance—Online Program (p. 80)
- Corporate Renewal (p. 81)
- Corporate Renewal—Online Program (p. 81)
- Healthcare Administration and Policy (p. 81)
- Innovation Management (p. 82)
- International Business (p. 82)
- International Business—Online Program (p. 82)
- Investments (p. 83)
- Leadership and Human Capital (p. 83)
- Marketing (p. 83)
- Marketing—Online Program (p. 84)
- Mutual Fund Management (p. 84)
- Supply Chain Management (p. 84)
- Supply Chain Management—Online Program (p. 85)
- Technological Entrepreneurship (p. 85)

Accounting and Financial Decision Making, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
ACCT 6200 and ACCT 6201	Financial Reporting and Managerial Decision Making 1 and Financial Reporting and Managerial Decision Making 2	4.5
MGSC 6200	Information Analysis	3
FINA 6200	Value Creation through Financial Decision Making	3
Elective		
Complete one of the following:		1.5-3
MGSC 6204	Managing Information Resources	
Any MBA core course titled 6200 (see below):		
HRMG 6200	Managing People and Organizations	
ENTR 6200	Enterprise Growth and Innovation	
INTB 6200	Managing the Global Enterprise	
MKTG 6200	Creating and Sustaining Customer Markets	
MECN 6200	Global Competition and Market Dominance	

Program Credit/GPA Requirements

12 total semester hours required, may complete a maximum of 15 semester hours
Minimum 3.000 GPA required

Accounting and Financial Decision Making—Online Program, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time online MBA (check with advisor). Minimum 3.000 GPA required throughout program duration and in order to complete certificate program.

Academic Standing/Progress

Minimum 3.000 GPA required in order to complete certificate program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

ACCT 6272	Financial Statement Preparation and Analysis	2.25
ACCT 6273	Identifying Strategic Implications in Accounting Data	2.25

FINA 6200	Value Creation through Financial Decision Making	3
MGSC 6200	Information Analysis	3
MGSC 6204	Managing Information Resources	1.5

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Business Administration, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. With the advice of their academic advisors, students tailor their own course of study either within a specific discipline or across disciplines.

The Graduate Certificate in Business Administration at the D'Amore-McKim School of Business is designed to help you learn the skills you need to excel today, while earning credits to drive you toward tomorrow's goals. Your program will consist of four to six business courses. You may accelerate the curriculum and complete it in as little as eight months, or take up to three years to finish. You may choose to focus on one area of specialty or gain fundamental business knowledge by enrolling in a variety of courses.

There are three tracks within the Graduate Certificate of Business Administration:

The part-time MBA track is for students who are specifically interested in pursuing the part-time MBA upon completion of the certificate program. Upon successful completion of this track, students are eligible to waive the GMAT/GRE requirement for admission into the part-time MBA and part-time MBA/MS finance programs. To be eligible for the GMAT/GRE waiver, one must complete the track with a B or better in each course and earn a minimum cumulative GPA of 3.300.

The international student track is an opportunity for international students to study full-time, earning 15 graduate credits over two consecutive semesters. Students must take five core MBA courses as they become available for this particular section and must be enrolled full-time in their first semester of study.

Customize your schedule and **build your own track** by taking any 12 credits within the part-time MBA program assuming you meet prerequisites per course.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Tracks

Complete one of the following three tracks. *Note:* The part-time MBA track and the international student track require an additional 3 semester hours.

PART-TIME MBA TRACK

ACCT 6200	Financial Reporting and Managerial Decision Making 1	3
ACCT 6201	Financial Reporting and Managerial Decision Making 2	1.5
FINA 6200	Value Creation through Financial Decision Making	3
HRMG 6200	Managing People and Organizations	3
MGSC 6200	Information Analysis	3
MGSC 6204	Managing Information Resources	1.5

INTERNATIONAL STUDENT TRACK

ACCT 6200	Financial Reporting and Managerial Decision Making 1	3
ENTR 6200	Enterprise Growth and Innovation	3
HRMG 6200	Managing People and Organizations	3
INTB 6200	Managing the Global Enterprise	3
MKTG 6200	Creating and Sustaining Customer Markets	3

BUILD YOUR OWN TRACK

Customize your schedule by taking any 12 credits within the part-time MBA program assuming you meet prerequisites per course.

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Business Administration—Online Program, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's Online Graduate Certificate in Business Administration offers a convenient way to learn the specific skills you need to seize a new career opportunity. With the advice of your advisor, you can tailor your own course of study within a specific discipline or across disciplines.

Academic Standing/Progress

Minimum 3.000 GPA required in order to complete certificate program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Complete 12 semester hours from the following:		12
HRMG 6200	Managing People and Organizations	
MGSC 6200	Information Analysis	
MGSC 6204	Managing Information Resources	
HRMG 6200	Managing People and Organizations	
FINA 6200	Value Creation through Financial Decision Making	
ACCT 6272	Financial Statement Preparation and Analysis	
ACCT 6273	Identifying Strategic Implications in Accounting Data	
MGSC 6200	Information Analysis	
FINA 6203	Investment Analysis	
FINA 6204	International Finance Management	
FINA 6205	Financial Strategy	

FINA 6211	Financial Risk Management
FINA 6213	Investment Banking
FINA 6214	Mergers and Acquisitions
FINA 6215	Business Turnarounds
FINA 6216	Valuation and Value Creation
FINA 6217	Real Estate Finance and Investment
MECN 6205	Sustainability and the Economics of Markets
ENTR 6211	Entrepreneurship: Services and Retail Business Creation
ENTR 6216	Global Social Entrepreneurship and Innovation
ENTR 6200	Enterprise Growth and Innovation
ENTR 6212	Business Planning for New Ventures
ENTR 6210	Managing Operations in Early Stage Ventures
MKTG 6212	International Marketing
MECN 6200	Global Competition and Market Dominance
MKTG 6200	Creating and Sustaining Customer Markets
MKTG 6210	Marketing Research
MKTG 6214	New Product Development
MKTG 6216	Market Focused Strategy
MKTG 6218	Marketing in Service Sector
MKTG 6222	Digital Marketing
MKTG 6223	Brand and Advertising Management
MKTG 6212	International Marketing
MKTG 6225	Sustainability and Innovation in Product Design
MGMT 6222	Healthcare Industry
MGMT 6223	Strategic Decision Making for Healthcare Professionals
MGMT 6225	Sustainability and Leadership
MGMT 6226	Sustainability and the Business Environment
MGMT 6283	Business Law, Corporate Governance, and Intellectual Property Strategies
MGSC 6221	Introduction to Health Informatics and Health Information Systems
INTB 6200	Managing the Global Enterprise
INTB 6212	Cultural Aspects of International Business
INTB 6217	Creating Sustainable Competitive Advantage through Global Innovation
HRMG 6217	Virtual, Vicious Teams: Building and Leading High-Performance Teams
SCHM 6213	Global Supply Chain Strategy
SCHM 6210	Supply Chain Management
SCHM 6211	Logistics and Transportation Management
SCHM 6214	Sourcing and Procurement
SCHM 6220	Growing and Protecting Business Value through the Supply Chain
SCHM 6221	Sustainability and Supply Chain Management

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Corporate Finance, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course		
FINA 6205	Financial Strategy	3
Electives		
Complete 9 semester hours from the following:		9
FINA 6211	Financial Risk Management	
FINA 6213	Investment Banking	
FINA 6214	Mergers and Acquisitions	
FINA 6215	Business Turnarounds	
FINA 6216	Valuation and Value Creation	
FINA 6221	Entrepreneurial Finance	
FINA 6222	Risk Management and Insurance	
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity	
ACCT 6210	Analyzing Financial Statements to Assess Firm Performance, Strategy, and Value	
Any MBA core course titled 6200 (see below):		
ACCT 6200	Financial Reporting and Managerial Decision Making 1	
HRMG 6200	Managing People and Organizations	
INTB 6200	Managing the Global Enterprise	
MKTG 6200	Creating and Sustaining Customer Markets	
MECN 6200	Global Competition and Market Dominance	
STRT 6200	Strategic Decision Making in a Changing Environment	

Program Credit/GPA Requirements

12 total semester hours required, may complete a maximum of 15 semester hours
Minimum 3.000 GPA required

Corporate Finance—Online Program, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change.

And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time online MBA (check with advisor).

Academic Standing/Progress

Minimum 3.000 GPA required in order to complete certificate program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course		
FINA 6205	Financial Strategy	3
Electives		
Complete 9 semester hours from the following:		9
FINA 6211	Financial Risk Management	
FINA 6213	Investment Banking	
FINA 6214	Mergers and Acquisitions	
FINA 6215	Business Turnarounds	
FINA 6216	Valuation and Value Creation	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Corporate Renewal, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Complete 12 semester hours from the following:		12
ENTR 6214	Social Enterprise	
FINA 6215	Business Turnarounds	
FINA 6216	Valuation and Value Creation	
FINA 6221	Entrepreneurial Finance	
HRMG 6212	Creating an Innovative Organization	
HRMG 6218	Great Companies	
MKTG 6214	New Product Development	
MKTG 6216	Market Focused Strategy	
MGMT 6214	Negotiations	

Program Credit/GPA Requirements

12 total semester hours required, may complete a maximum of 15 semester hours
Minimum 3.000 GPA required

Corporate Renewal—Online Program, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time online MBA (check with advisor).

Academic Standing/Progress

Minimum 3.000 GPA required in order to complete certificate program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

FINA 6215	Business Turnarounds	3
FINA 6216	Valuation and Value Creation	3
MKTG 6214	New Product Development	3
MKTG 6216	Market Focused Strategy	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Healthcare Administration and Policy, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
HINF 5105	The American Healthcare System	3
STRT 6220	Strategic Management for Healthcare Organizations	3
HRMG 6220	Health Organization Management	3
Elective		
Complete 3 semester hours from the following:		3
HINF 5101	Introduction to Health Informatics and Health Information Systems	

LAW 7617	Economic Perspectives on Health Policy
PHTH 5232	Evaluating Healthcare Quality
SCHM 6223	Managing Healthcare Supply Chain Operations

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Innovation Management, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course		
ENTR 6200	Enterprise Growth and Innovation	3
Electives		
Complete 9 semester hours from the following:		9
ENTR 6212	Business Planning for New Ventures	
ENTR 6214	Social Enterprise	
ENTR 6218	Business Model Design and Innovation	
ENTR 6220	Family Business Leadership and Governance	
ENTR 6222	Competing in Dynamic, Innovation-Driven Markets	
ENTR 6224	Intellectual Property and Other Legal Aspects of Business and Innovation	
ENTR 6225	Corporate Entrepreneurship through Global Growth, Acquisitions, and Alliances	
ENTR 6293	Design Thinking for Market-Driven Innovation	
MGMT 6210	Law for Managers and Entrepreneurs	
MKTG 6214	New Product Development	
TECE 6222	Emerging and Disruptive Technologies	
TECE 6230	Entrepreneurial Marketing and Selling	
TECE 6250	Lean Design and Development	
TECE 6300	Managing a Technology-Based Business	
TECE 6340	The Technical Entrepreneur as Leader	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

International Business, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
INTB 6200	Managing the Global Enterprise	3
INTB 6212	Cultural Aspects of International Business	3
Electives		
Complete 6 semester hours from the following:		6
ENTR 6200	Enterprise Growth and Innovation	
FINA 6204	International Finance Management	
INTB 6224	Competing to Win in Emerging Markets	
INTB 6230	International Field Study	
MECN 6200	Global Competition and Market Dominance	
MKTG 6212	International Marketing	
SCHM 6213	Global Supply Chain Strategy	

Program Credit/GPA Requirements

12 total semester hours required, may take a maximum of 15 credits
Minimum 3.000 GPA required

International Business—Online Program, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time online MBA (check with advisor).

Academic Standing/Progress

Minimum 3.000 GPA required in order to complete certificate program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
INTB 6200	Managing the Global Enterprise	3
INTB 6212	Cultural Aspects of International Business	3

Electives		
Complete 6 semester hours from the following:		6
ENTR 6200	Enterprise Growth and Innovation	
FINA 6204	International Finance Management	
MECN 6200	Global Competition and Market Dominance	
MKTG 6212	International Marketing	
SCHM 6213	Global Supply Chain Strategy	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Investments, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course		
FINA 6203	Investment Analysis	3
Electives		
Complete 9 semester hours from the following:		9
FINA 6211	Financial Risk Management	
FINA 6212	Fixed Income Securities and Risk	
FINA 6213	Investment Banking	
FINA 6217	Real Estate Finance and Investment	
FINA 6218	Personal Financial Planning	
FINA 6219	Portfolio Management	
FINA 6222	Risk Management and Insurance	
ACCT 6210	Analyzing Financial Statements to Assess Firm Performance, Strategy, and Value	

Program Credit/GPA Requirements

12 total semester hours required, may take a maximum of 15 credits
Minimum 3.000 GPA required

Leadership and Human Capital, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course		
HRMG 6200	Managing People and Organizations	3
Electives		
Complete 9 semester hours from the following:		9
HRMG 6210	Managing Professionals and High Performance Teams	
HRMG 6212	Creating an Innovative Organization	
HRMG 6213	Leadership	
HRMG 6214	A Management Perspective of Human Resource Management	
HRMG 6218	Great Companies	
HRMG 6219	Leadership for Environmental Sustainability	
HRMG 6220	Health Organization Management	
MGMT 6214	Negotiations	
STRT 6210	Workforce Metrics and Analytics	

Program Credit/GPA Requirements

12 total semester hours required, may take a maximum of 15 credits
Minimum 3.000 GPA required

Marketing, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course		
MKTG 6200	Creating and Sustaining Customer Markets	3
Electives		
Complete 9 semester hours from the following:		9
MKTG 6212	International Marketing	
MKTG 6214	New Product Development	
or TECE 6250	Lean Design and Development	
MKTG 6216	Market Focused Strategy	
MKTG 6218	Marketing in Service Sector	
MKTG 6222	Digital Marketing	
MKTG 6223	Brand and Advertising Management	

MKTG 6224	B2B and Strategic Sales
MKTG 6226	Consumer Behavior
MKTG 6260	Special Topics in Marketing

Program Credit/GPA Requirements

12 total semester hours required, may take a maximum of 15 credits
Minimum 3.000 GPA required

Marketing—Online Program, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time online MBA (check with advisor).

Academic Standing/Progress

Minimum 3.000 GPA required in order to complete certificate program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course		
MKTG 6200	Creating and Sustaining Customer Markets	3
Electives		
Complete 9 semester hours from the following:		9
MKTG 6212	International Marketing	
MKTG 6214	New Product Development	
MKTG 6216	Market Focused Strategy	
MKTG 6218	Marketing in Service Sector	
MKTG 6222	Digital Marketing	
MKTG 6223	Brand and Advertising Management	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Mutual Fund Management, Graduate Certificate

Business professionals are much like businesses themselves—as opportunities emerge and the marketplace evolves, their needs change. And sometimes, the best investment in your future is the one you can make now. D'Amore-McKim's specialty graduate certificates are the perfect way to learn the specific skills you need to seize a new career opportunity. They're also a great way to put an educational down payment on longer-term ambitions. Credits earned in this program can transfer into the part-time MBA or other master's programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Prerequisite Course Work		
FINA 6200	Value Creation through Financial Decision Making (Required for admission)	
Required Course Work		
Complete 9 semester hours from the following:		9
FINA 6202	Analysis of Financial Institutions and Markets	
FINA 6203	Investment Analysis	
FINA 6212	Fixed Income Securities and Risk	
FINA 6219	Portfolio Management	
FINA 6360	Fund Management for Analysts	
or FINA 6361	Fund Management for Managers	

Program Credit/GPA Requirements

12 total semester hours required, may take a maximum of 15 credits
Minimum 3.000 GPA required

Supply Chain Management, Graduate Certificate

The Graduate Certificate in Supply Chain Management allows students to take four courses in the supply chain discipline over the two semesters or up to three years. There is a required curriculum for the certificate program. Credits earned in this program can transfer into the MBA as electives or other master's programs around Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
SCHM 6201	Operations and Supply Chain Management	3
SCHM 6213	Global Supply Chain Strategy	3
Elective		
Complete 6 semester hours from the following:		6
SCHM 6211	Logistics and Transportation Management	
SCHM 6212	Executive Roundtable in Supply Chain Management	
SCHM 6214	Sourcing and Procurement	
SCHM 6215	Supply Chain Analytics	
SCHM 6221	Sustainability and Supply Chain Management	
SCHM 6222	Managing Emerging Issues in Supply Chain Management	
SCHM 6223	Managing Healthcare Supply Chain Operations	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Supply Chain Management—Online Program, Graduate Certificate

The dynamic field of supply chain management has become increasingly important as more companies use supply chain strategies as a means of market differentiation—and no certificate program better prepares you to thrive in this environment than D'Amore-McKim's. We were one of the pioneers in supply chain research and education, and our supply chain faculty continues to be one of the largest and most experienced.

Academic Standing/Progress

Minimum 3.000 GPA required in order to complete certificate program

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
SCHM 6210	Supply Chain Management	3
SCHM 6213	Global Supply Chain Strategy	3
Electives		
Complete two of the following:		6
SCHM 6211	Logistics and Transportation Management	
SCHM 6214	Sourcing and Procurement	
SCHM 6221	Sustainability and Supply Chain Management	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Technological Entrepreneurship, Graduate Certificate

The Graduate Certificate in Technological Entrepreneurship is tailor-made for engineers, designers, and other technology professionals who want to lead entrepreneurial ventures within their current companies or have product ideas they'd like to develop on their own. Working with your classmates in multidisciplinary teams, you have an opportunity to examine technological and business issues from an integrative perspective and learn the marketing, planning, and product development principles essential to any successful new venture.

Credits earned in the certificate program may be applied toward the Master of Science in Technological Entrepreneurship, the part-time MBA, or other MS programs at Northeastern (check with advisor).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
ENTR 6200	Enterprise Growth and Innovation	3
ENTR 6212	Business Planning for New Ventures	3
Electives		
Complete 6 semester hours from the following:		6
ENTR 6218	Business Model Design and Innovation	
ENTR 6219	Financing Ventures from Early Stage to Exit	
ENTR 6222	Competing in Dynamic, Innovation-Driven Markets	
TECE 6222	Emerging and Disruptive Technologies	
TECE 6230	Entrepreneurial Marketing and Selling	
TECE 6250	Lean Design and Development	
TECE 6300	Managing a Technology-Based Business	
TECE 6340	The Technical Entrepreneur as Leader	

Program Credit/GPA Requirements

12 total semester hours required, may take a maximum of 15 credits
Minimum 3.000 GPA required

College of Computer and Information Science

Website (http://www.ccis.northeastern.edu)

Carla E. Brodley, PhD, Dean

Bryan Lackaye, EdD, Associate Dean for Graduate School Administration
Rajmohan Rajaraman, PhD, Associate Dean and Director of Graduate Studies
Karen Rosen, MEd, Director of Graduate Co-op Program

202 West Village H
617.373.6840
gradschool@ccs.neu.edu

At the College of Computer and Information Science (CCIS), we are inspired by our information-driven world and strive to make it a better place. Our students engage in rigorous learning and real-world co-op experiences. Our renowned faculty shapes minds, sparks innovation, and inspires ideas. Our interdisciplinary research breaks new ground to solve everyday problems.

CCIS maintains a strong research program with significant funding from the major federal research agencies and private industry. With a substantial increase in faculty strength and research funding in recent years, we are actively seeking highly motivated, bright, hardworking students who are interested in pursuing a PhD degree in computer science or in the interdisciplinary field of information assurance, network science, or personal health informatics. Graduate students and faculty members are involved in exciting projects in a wide range of research areas, including programming languages, software engineering, distributed and parallel computing, cryptography, network security, health informatics, network science, databases, information retrieval, and artificial intelligence. Colloquia and weekly research seminars contribute to the vibrant research atmosphere in the college.

Our curriculum encompasses both the breadth and depth needed for graduate school. Specialized, advanced courses for PhD students in computer science, information assurance, and personal health informatics are designed to prepare all students for research early in their doctoral education.

The MS curriculum in computer science combines the study of basic algorithms and theoretical computer science principles with advanced programming and software design methods. It offers students the opportunity to develop the analytical and problem-solving skills needed to pursue challenging professional careers.

In addition, we offer five interdisciplinary master's degree programs: the Master of Science in Health Informatics program, which seeks to prepare graduates to use information technology to improve healthcare delivery and outcomes; the Master of Science in Information Assurance program, which focuses on information technology and incorporates the understanding of the social sciences, law, criminology, and management needed to prevent and combat cyberattacks; the Master of Science in Data Science program, which is designed to give students a comprehensive framework for processing, modeling, analyzing, and reasoning about data; the Master of Science in Health Data Analytics program, which prepares students to succeed in an emerging field at the intersection of health informatics, data science, and computational modeling; and the Master of Science in Game Science and Design, which gives students a comprehensive understanding of how successful game products are created in a player-centric environment.

The ALIGN program enables intellectually curious students to earn a Master of Science in Computer Science, Information Assurance, or Health Informatics without backgrounds in these fields. Regardless of undergraduate major or current experience, ALIGN's custom curricula prepares students for high-demand industries.

Three student laboratories house a mix of Linux and Windows workstations and separate research lab facilities. In addition, the Information Assurance Laboratory provides students with hands-on experience in information assurance exercises in an isolated network environment.

Our college is a tightly knit community, and the faculty, staff, and students interact regularly through yearly town hall meetings, weekly teas, and seminars. A diverse, multicultural graduate student body and faculty members encourage rich extracurricular interaction. The student chapter of the Association for Computing Machinery organizes a number of social events to promote friendship and camaraderie within the CCIS community.

Academic Policies and Procedures

Absenteeism

Students are expected to attend all classes and lab sections for their registered courses. Any student who anticipates missing a class due to illness or emergency situations is expected to contact their professor as soon as possible. The College of Computer and Information Science requires all students to be present and on campus during the start of every semester. Students are welcome to travel over winter and summer breaks but should return to campus in a timely manner and be ready for the start of each semester. The Office of the Registrar posts current and future academic calendars (http://www.northeastern.edu/registrar/calendars.html) on their website.

ACADEMIC INTEGRITY

The college takes academic integrity violations very seriously. Students found participating in any of the following situations will be reported to the Office of Student Conduct and Conflict Resolution: cheating, fabrication, plagiarism, unauthorized collaboration. Please note that this applies to programming code as well as written assignments or exams. Additionally, students may be subject to receiving a reduced or failing grade for the assignment or the course, or, depending on the severity of the violation, students may be dismissed from the program. Visit the Office of Student Conduct and Conflict Resolution web page (http://www.northeastern.edu/osccr/academic-integrity-policy) for a full description of these policies and procedures.

Academic Probation and Dismissal

A student whose overall GPA falls below 3.000 will be automatically placed on academic probation and will be notified by the college. Once on probation, a student has one academic semester (summer excluded) to achieve a 3.000 GPA. If the GPA is still unsatisfactory at the end of that semester, the student will be eligible for dismissal from the graduate program.

Transfer of Credit

A maximum of 9 semester hours of credit obtained at another institution may be accepted toward the degree, provided the credits meet the following criteria:

- Work is completed at the graduate level for graduate credit
- Student received a grade of 3.000 or better
- Credits were earned at an accredited institution
- Credits have not been used toward any other degree

Transfer credit will be offered only for courses that match a course offered at Northeastern University and that have been approved by the graduate committee. However, no transfer credit will be given for courses listed as Interdisciplinary courses.

Students can submit a request for transfer of credit after they have begun taking courses in the College of Computer and Information Science (CCIS). Please see your academic advisor for the procedure to submit a request.

Computer Science

At the College of Computer and Information Science (CCIS), we are inspired by an increasingly interconnected society, informed by a rapidly changing job market, and focused on addressing the challenges of a complex world. Our goal is to equip students with knowledge as diverse as it is deep. Our programs provide a strong technical foundation and an essential understanding of computing concepts while integrating computer, data, and information sciences across disciplines and industries.

Our master's degrees are advanced programs that are designed to prepare students to be job ready through a rigorous curriculum, innovative research, experiential learning, and a collaborative environment rich in faculty expertise.

Our research-driven doctoral programs offer students an opportunity to engage in exciting projects, a vibrant community, and a challenging curriculum that offers breadth and depth in areas both within computer science and across disciplines throughout Northeastern.

Graduate education in computer science also features the top-ranked Northeastern co-op program, enabling students to supplement their classroom education with real-world experience in the field. We have consistently placed more than 95 percent of our students in co-op positions. The college partners with several high-profile companies, including:

- Amazon
- Bloomberg
- EMC Corporation
- Fidelity Investments
- IBM Corporation
- Intuit
- Kronos
- MathWorks
- Microsoft
- Nokia
- Phase Forward
- SeaChange International
- Verizon Communications

Programs

Doctor of Philosophy (PhD)

- Computer Science (p. 87)
- Computer Science—Advanced Entry (p. 90)

Master of Science (MS)

- Data Science (p. 90)

Master of Science in Computer Science (MSCS)

- Computer Science (p. 92)
- Computer Science—ALIGN Program (p. 93)

Graduate Certificate

- Computer Science (p. 95)

Computer Science, PhD

Academic Requirements for PhD in Computer Science

A minimum of 48 semester hours of course work beyond the BS/BA degree is required of all students.

Admission to Candidacy

All students must demonstrate sufficient knowledge in the fundamentals of computer science, as well as the ability to carry out research in an area of computer science.

The student must maintain a minimum grade-point average (GPA) of 3.500 among the six core courses satisfying the above course requirements and receive a grade of B or better in each of these courses. Students who have taken equivalent courses in other institutions may petition to be exempted from the course(s) (subject to the approval of the PhD committee). Each student may repeat a course once for no more than three out of the six courses if they do not receive a B or better in the course. Students with an Master of Science in Computer Science may petition to the PhD committee for an exemption from these courses. Petition forms are available on the college website.

The fields listed do not necessarily represent areas of specialization or separate tracks within the PhD program. Rather, they attempt to delineate areas on which the student must be examined in order to measure his or her ability to complete the degree. Therefore, they may be adjusted in the future to reflect changes in the discipline of computer science and in faculty interests within the College of Computer and Information Science (CCIS). Similarly, these fields do not represent the only areas in which a student may write his or her dissertation. They are, however, intended to serve as a basis for performing fundamental research in computer science.

Paper Requirement

To demonstrate research ability, the student is required to submit to the PhD committee a research or a survey paper in an area of specialty under

the supervision of a faculty advisor. A submitted paper from a student is considered to have fulfilled the paper requirement if:

1. The paper has been submitted to a selective conference.
2. The student has made a substantial contribution to the paper.
3. The advisor has endorsed the paper with a written statement indicating the student's contribution.
4. The PhD committee has voted on a positive recommendation. The committee may require a presentation from the student before making a recommendation.

Upon completion of the course and the research paper requirements, the student is admitted to candidacy for the PhD degree. It is highly recommended that the student complete the candidacy requirement by the end of his or her second year but no later than the third year.

Residency

One year of continuous full-time study is required after admission to the PhD candidacy. It is expected that during this period the student will make substantial progress in preparing for the comprehensive examination.

Teaching Requirement

All computer science PhD students must satisfy the teaching requirement in order to graduate. This requirement is fulfilled when the student works as a teaching assistant (TA) or instructor of record (IoR) for one semester and during this semester:

- Teaches at least 3 hours of classes
- Prepares at least one assignment, or quiz, or equivalent

PhD students are expected to satisfy the teaching requirement some time after completing their first year and at least one semester prior to scheduling their PhD defense.

Comprehensive Examination/Dissertation Proposal

The examination is taken after the student has achieved sufficient depth in a field of study in order to prepare a prospectus for the PhD dissertation. This process should take place no later than the end of the fifth year in residence. Prior to taking the comprehensive examination, the student prepares a thesis proposal for the examination, which describes the proposed research, including the relevant background materials from the literature. The thesis proposal should clearly specify the research problems to be attacked, the techniques to be used, and a schedule of milestones toward completion. Normally, the thesis proposal should not exceed 15 pages, excluding appendices and bibliography.

The thesis proposal must be approved by the comprehensive committee. It is strongly recommended that the same members should serve on both the comprehensive and thesis committees. With the help of the advisor, a student selects the comprehensive committee, consisting of four members to be approved by the PhD committee. The four members must include the advisor, two other faculty members from the college, and an external examiner (optional for comprehensive committee).

To help the PhD committee to make an informed decision, a copy of the external examiner's resumé should be submitted at the same time. Upon approval of the written proposal, the student has to present the proposed work orally in a public forum, followed by a closed-door oral examination from the comprehensive committee. The student may take the comprehensive examination twice, at most.

Doctoral Dissertation

Upon successful completion of solving the research proposed in the thesis proposal, the candidate has an opportunity to prepare the dissertation for approval by the doctoral committee. The dissertation must contain results of extensive research and make an original contribution to the field of computer science. The work should give evidence of the candidate's ability to carry out independent research. It is expected that the dissertation should be of sufficient quality to merit publication in a reputable journal in computer science.

DOCTORAL COMMITTEE

If the thesis committee is the same as the comprehensive committee, no further approval is needed. If the thesis committee is changed in its composition, the approval process will follow that of the comprehensive committee.

DISSERTATION DEFENSE

The dissertation defense is held in accordance with the regulations of the University Graduate Council. It consists of a lecture given by the candidate on the subject matter of the dissertation. This is followed by questions from the doctoral committee and others in attendance concerning the results of the dissertation as well as any related matters. The examination is chaired by the PhD advisor.

TIME AND TIME LIMITATION

After the establishment of degree candidacy, a maximum of five years will be allowed for the completion of the degree requirements, unless an extension is granted by the college graduate committee.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Course requirements
Paper requirement
Comprehensive exam/dissertation proposal
Dissertation defense

Core Requirement

A grade of B or higher is required in each course. A cumulative 3.500 GPA is required for the core requirement.

Breadth Areas		
Complete one course from four of the five following breadth areas:		16
Artificial Intelligence and Data Science		
CS 6140	Machine Learning	
CS XXXX	(Applied Statistics)	
Human-Centered Computing		
CS 5340	Computer/Human Interaction	
CS 7295	Special Topics in Data Visualization	
Software		
CS 7400	Intensive Principles of Programming Languages	
CS 6410	Compilers	
Systems		
CS 7600	Intensive Computer Systems	
Theory		
CS 7800	Advanced Algorithms	
CS 7805	Theory of Computation	

Specialization Courses	
Complete 8 semester hours from the specialization course lists. (p. 89)	8

Electives

Complete 24 semester hours in the following:	24
Note: Consult faculty advisor for the other acceptable courses.	
CS 5100 to CS 5850	
CS 6110 to CS 6810	
CS 8982 Readings	

Dissertation

Upon achieving PhD candidacy, complete the following (repeatable) courses for two consecutive semesters:	
CS 9990	Dissertation
CS 8982	Readings
For remaining semester(s), complete the following (repeatable) course until graduation:	
CS 9996	Dissertation Continuation

Specialization Course Lists

Artificial Intelligence	
CS 5100	Foundations of Artificial Intelligence
CS 5335	Robotic Science and Systems
CS 6110	Knowledge-Based Systems
CS 6120	Natural Language Processing
CS 6140	Machine Learning
CS 7140	Advanced Machine Learning
CS 7170	Seminar in Artificial Intelligence
CS 7180	Special Topics in Artificial Intelligence
Computer-Human Interface	
CS 5340	Computer/Human Interaction
CS 5350	Applied Geometric Representation and Computation
CS 6350	Empirical Research Methods
CS 7140	Advanced Machine Learning
Data Science	
CS 5200	Database Management Systems
CS 6140	Machine Learning
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6240	Large-Scale Parallel Data Processing
CS 7270	Seminar in Database Systems
CS 7280	Special Topics in Database Management
CS 7290	Special Topics in Data Science
Graphics	
CS 5310	Computer Graphics
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5520	Mobile Application Development
CS 6310	Computational Imaging
CS 7370	Seminar in Graphics/Image Processing
CS 7380	Special Topics in Graphics/Image Processing
Information Security	
CS 5770	Software Vulnerabilities and Security
CS 6540	Foundations of Formal Methods and Software Analysis
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6760	Privacy, Security, and Usability
CS 7580	Special Topics in Software Engineering
Networks	
CS 5700	Fundamentals of Computer Networking
CS 5750	Social Computing
CS 6710	Wireless Network
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6760	Privacy, Security, and Usability
CS 7770	Seminar in Computer Networks
CS 7775	Seminar in Computer Security
CS 7780	Special Topics in Networks
Programming Languages	
CS 5400	Principles of Programming Language
CS 6410	Compilers
CS 6412	Semantics of Programming Language
CS 6510	Advanced Software Development
CS 6515	Software Development
CS 7470	Seminar in Programming Languages
CS 7480	Special Topics in Programming Language
CS 7485	Special Topics in Formal Methods
CS 7570	Seminar in Software Development
Software Engineering	
CS 5610	Web Development
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6530	Analysis of Software Artifacts
CS 6535	Engineering Reliable Software
CS 6540	Foundations of Formal Methods and Software Analysis
CS 7575	Seminar in Software Engineering
CS 7580	Special Topics in Software Engineering
Systems	
CS 5620	Computer Architecture
CS 5650	High Performance Computing
CS 6610	Parallel Computing
CS 6650	Building Scalable Distributed Systems
CS 6740	Network Security
CS 7670	Seminar in Computer Systems
CS 7680	Special Topics in Computer Systems
Theory	
CS 6610	Parallel Computing
CS 6750	Cryptography and Communications Security

CS 6800	Application of Information Theory
CS 6810	Distributed Algorithms
CS 7485	Special Topics in Formal Methods
CS 7805	Theory of Computation
CS 7870	Seminar in Theoretical Computer Science
CS 7880	Special Topics in Theories of Computer Science
Game Design	
CS 5150	Game Artificial Intelligence
CS 5310	Computer Graphics
CS 5340	Computer/Human Interaction
CS 5850	Building Game Engines
CS 7140	Advanced Machine Learning

Program Credit/GPA Requirements

48 total semester hours required
Minimum overall 3.000 GPA required

Plan of Study
Sample Curriculum

Year 1

Fall	Hours	Spring	Hours
Breadth course	4	Breadth course	4
Core elective	4	Core elective	4
	8		8

Year 2

Fall	Hours	Spring	Hours
Breadth course	4	Breadth course	4
Open elective	4	Open elective	4
	8		8

Year 3

Fall	Hours	Spring	Hours
CS 9990	4	CS 9990	4
CS 8982	4	CS 8982	4
	8		8

Year 4

Fall	Hours	Spring	Hours
CS 9996	0	CS 9996	0
	0		0

Year 5

Fall	Hours	Spring	Hours
CS 9996	0	CS 9996	0
	0		0

Year 6

Fall	Hours	Spring	Hours
CS 9996	0	CS 9996	0
	0		0

Total Hours: 48

Computer Science, PhD—Advanced Entry

Academic Requirements for Advanced-Entry PhD in Computer Science

A minimum of 16 semester hours of course work beyond the master's degree (excluding the six required core courses) is required of all students.

Admission to Candidacy

Refer to the Computer Science, PhD, overview for admission to candidacy requirements.

Paper Requirement

Refer to the Computer Science, PhD, overview, for research/survey paper requirements.

Residency

Refer to the Computer Science, PhD, overview, for residency requirements.

Comprehensive Examination/Dissertation Proposal

Refer to the Computer Science, PhD, overview, for comprehensive examination requirements.

Doctoral Dissertation

Refer to the Computer Science, PhD, overview, for doctoral dissertation and completion requirements.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Course requirements
Paper requirement
Comprehensive exam/dissertation proposal
Dissertation Defense

General Requirements

Complete 16 semester hours of approved course work. Consult your faculty advisor for acceptable courses. Students must maintain a minimum GPA of 3.500 as well as earn a grade of B or better in each course.

Dissertation

Upon achieving PhD candidacy, complete the following (repeatable) courses for two consecutive semesters:	
CS 9990	Dissertation
CS 8982	Readings
For remaining semester(s), complete the following (repeatable) course until graduation:	
CS 9996	Dissertation Continuation

Program Credit/GPA Requirements

16 total semester hours required
Minimum overall 3.000 GPA required

Data Science, MS

The College of Computer and Information Science (CCIS) and the Department of Electrical and Computer Engineering (ECE) jointly offer a

new interdisciplinary Master of Science program in data science. This program is designed to give students a comprehensive framework for processing, modeling, analyzing, and reasoning about data. Students will engage in an extensive core intended to develop depth in computational modeling, data collection and integration, data storage and retrieval, data processing, modeling and analytics, and visualization. Students will also be given a variety of elective areas in CCIS, the College of Engineering (COE), and throughout the campus to explore key contextual areas or more complex technical applications. Successful program graduates will be well positioned to attain data scientist and data engineer positions in a fast-growing field or to progress into doctoral degrees in related disciplines.

The Master of Science in Data Science is comprised of eight courses; five core courses and three electives. The core courses are designed and developed by the CCIS and ECE faculty. Elective courses consist of graduate courses offered in CCIS, COE, and other partner colleges.

Course Requirements

The Master of Science in Data Science curriculum requires five core courses that represent the essential mathematical/statistical and technical knowledge for deep data analysis. These courses examine foundational programming concepts and languages, integration, collection, storage, retrieval, large-scale computing, mathematical concepts in statistics, linear algebra, and optimization, as well as visual and computational analysis, machine learning, and visualization. The courses are tailored toward technically or mathematically trained students.

The five core courses include:

- Two core courses in algorithms and data processing
- Two core courses in machine learning and data mining
- One core course in information visualization

Three elective courses are drawn from a selection of courses across Northeastern.

Learning Outcomes

Students who complete the MS degree will be able to:

- Collect data from numerous sources (databases, files, XML, JSON, CSV, and Web APIs) and integrate them into a form in which the data is fit for analysis
- Use R and Python to explore data, produce summary statistics, perform statistical analyses; use standard data mining and machine-learning models for effective analysis
- Select, plan, and implement storage, search, and retrieval components of large-scale structure and unstructured repositories
- Retrieve data for analysis, which requires knowledge of standard retrieval mechanisms such as SQL and XPath, but also retrieval of unstructured information such as text, image, and a variety of alternate formats
- Match the methodological principles and limitations of machine learning and data mining methods to specific applied problems and communicate the applicability and the advantages/disadvantages of the methods in the specific problem to nondata experts
- Carry out the full data analysis workflow, including unsupervised class discovery, supervised class comparison, and supervised class prediction; Summarize, interpret, and communicate the analysis of results
- Organize visualization of data for analysis, understanding, and communication; choose appropriate visualization method for a given data type using effective design and human perception principle
- Develop methods for modeling, analyzing, and reasoning about data arising in one or more application domains such as social science, health informatics, web and social media, climate informatics, urban informatics, geographical information systems, business analytics, bioinformatics, complex networks, public health, and game design
- Manage, process, analyze, and visualize data at scale. This outcome allows students to handle data where the conventional information technology fail.

Placement Exams

Each incoming masters student, regardless of his or her background, takes two placement exams administered one week prior to the beginning of the semester. The two exams cover fundamentals of computer science and programming skills and basic statistics, probability, and linear algebra. If the student does not get a B or above in a part of the placement exam, then the student must take the corresponding introductory course.

- Introduction to Programming for Data Science (DS 5010) The introductory course on fundamentals of programming and data structures covers data structures (lists, arrays, trees, hash tables, etc.), program design, programming practices, testing, debugging, maintainability, data collection techniques, and data cleaning and preprocessing. This course will have a class project where the students will use the concepts they learn to collect data from the web, clean, and preprocess and ready for analysis.
- Introduction to Linear Algebra and Probability for Data Science (DS 5020) The introductory course on basics of statistics, probability, and linear algebra covers random variables, frequency distributions, measures of central tendency, measures of dispersion, moments of a distribution, discrete and continuous probability distributions, chain rule, Bayes' rule, correlation theory, basic sampling, matrix operations, trace of a matrix, norms, linear independence and ranks, inverse of a matrix, orthogonal matrices, range and null space of a matrix, the determinant of a matrix, positive semidefinite matrices, eigenvalues and eigenvectors.

Program Requirements

Required Course Work

A grade of B or higher is required in the following courses:

Algorithms		
Complete 4 semester hours from the following:		4
CS 5800	Algorithms	
EECE 7205	Fundamentals of Computer Engineering	
Data Management and Processing		
DS 5110	Introduction to Data Management and Processing	4
Machine Learning and Data Mining		
DS 5220	Supervised Machine Learning and Learning Theory	4
DS 5230	Unsupervised Machine Learning and Data Mining	4
Presentation and Visualization		
DS 5500		

Electives

Complete 12 semester hours from the following:	12

College of Computer and Information Science	
CS 6200	Information Retrieval
CS 5100	Foundations of Artificial Intelligence
CS 6120	Natural Language Processing
CS 5750	Social Computing
CS 6350	Empirical Research Methods
CS 7180	Special Topics in Artificial Intelligence
CS 7280	Special Topics in Database Management
College of Engineering	
CIVE 7388	Special Topics in Civil Engineering
EECE 5639	Computer Vision
EECE 5640	High-Performance Computing
EECE 7335	Detection and Estimation Theory
EECE 7337	Information Theory
EECE 7360	Combinatorial Optimization
EECE 7370	Advanced Computer Vision
EECE 7397	Advanced Machine Learning
IE 5640	Data Mining for Engineering Applications
IE 7275	Data Mining in Engineering
IE 7280	Statistical Methods in Engineering
College of Social Sciences and Humanities	
PPUA 5261	Dynamic Modeling for Environmental Decision Making
PPUA 5262	Big Data for Cities
PPUA 5263	Geographic Information Systems for Urban and Regional Policy
PPUA 5266	Urban Theory and Science
PPUA 7237	Advanced Spatial Analysis of Urban Systems
POLS 7200	Perspectives on Social Science Inquiry
POLS 7201	Research Design
POLS 7202	Quantitative Techniques
D'Amore-McKim School of Business	
BUSN 6320	Business Analytics Fundamentals
BUSN 6324	Predictive Analytics for Managers
BUSN 6326	Introduction to Big Data and Digital Marketing Analytics
College of Science	
MATH 7340	Statistics for Bioinformatics
PHYS 5116	Complex Networks and Applications
PHYS 7305	Statistical Physics
PHYS 7321	Computational Physics
PHYS 7331	Network Science Data
Bouvé College of Health Sciences	
NRSG 5121	Epidemiology and Population Health
PHTH 5202	Introduction to Epidemiology
PHTH 5210	Biostatistics in Public Health
PHTH 5224	Social Epidemiology
College of Arts, Media and Design	
GSND 5110	Game Design and Analysis
GSND 6350	Game Analytics

Note: Students that take 3-credit-hour elective courses (i.e., Bouvé, CSSH courses) will register for an accompanying data science project course in the same semester ((DS 8982)). In order to earn this additional credit, students will be expected to work with faculty to design an additional project in line with the curricular aims of their chosen elective and the data science core learning outcomes.

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Computer Science, MSCS

Northeastern University's Master of Science in Computer Science is designed to prepare students for a variety of careers in computer science. The program combines both computing and important application domains—enabling you to increase your broad-based knowledge in the field while focusing on one curricular concentration selected from a range of options including artificial intelligence, computer human interface, graphics, programming languages, software engineering, database management, networks, theory, game design, systems, and information security.

Learning Outcomes

- Exhibit proficiency in the design and maintenance of large application software
- Develop the ability to maintain network infrastructure
- Build familiarity with basic algorithms and theoretical computer science principles
- Demonstrate ability in advanced programming and software design materials

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

A cumulative 3.000 GPA is required for the three core courses:

Programming		
CS 5010	Programming Design Paradigm	4
Development		
CS 5500	Managing Software Development	4
or CS 5600	Computer Systems	
Algorithms		
CS 5800	Algorithms	4

Electives

Complete 20 semester hours from the following. A minimum of 8 semester hours must be taken from the same specialization.		20
CS 5100 to CS 5850		
CS 6110 to CS 6810		
CS 8674	Master's Project	
CS 8982	Readings	
CS 7990	Thesis	
Specializations		
Artificial Intelligence		
CS 5100	Foundations of Artificial Intelligence	

CS 5335	Robotic Science and Systems
CS 6110	Knowledge-Based Systems
CS 6120	Natural Language Processing
CS 6140	Machine Learning
CS 7140	Advanced Machine Learning
CS 7170	Seminar in Artificial Intelligence
CS 7180	Special Topics in Artificial Intelligence
Computer-Human Interface	
CS 5340	Computer/Human Interaction
CS 5350	Applied Geometric Representation and Computation
CS 6350	Empirical Research Methods
CS 7140	Advanced Machine Learning
Database Management	
CS 5200	Database Management Systems
CS 6140	Machine Learning
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6240	Large-Scale Parallel Data Processing
CS 7270	Seminar in Database Systems
CS 7280	Special Topics in Database Management
Game Design	
CS 5150	Game Artificial Intelligence
CS 5310	Computer Graphics
CS 5340	Computer/Human Interaction
CS 5850	Building Game Engines
CS 7140	Advanced Machine Learning
Graphics	
CS 5310	Computer Graphics
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5520	Mobile Application Development
CS 6310	Computational Imaging
CS 7370	Seminar in Graphics/Image Processing
CS 7380	Special Topics in Graphics/Image Processing
Information Security	
CS 5770	Software Vulnerabilities and Security
CS 6540	Foundations of Formal Methods and Software Analysis
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6760	Privacy, Security, and Usability
CS 7580	Special Topics in Software Engineering
Networks	
CS 5700	Fundamentals of Computer Networking
CS 5750	Social Computing
CS 6710	Wireless Network
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6760	Privacy, Security, and Usability
CS 7770	Seminar in Computer Networks
CS 7775	Seminar in Computer Security
CS 7780	Special Topics in Networks
Programming Languages	
CS 5400	Principles of Programming Language
CS 6410	Compilers
CS 6412	Semantics of Programming Language
CS 6510	Advanced Software Development
CS 6515	Software Development
CS 7470	Seminar in Programming Languages
CS 7480	Special Topics in Programming Language
CS 7570	Seminar in Software Development
Software Engineering	
CS 5610	Web Development
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6530	Analysis of Software Artifacts
CS 6535	Engineering Reliable Software
CS 6540	Foundations of Formal Methods and Software Analysis
CS 6650	Building Scalable Distributed Systems
CS 7575	Seminar in Software Engineering
CS 7580	Special Topics in Software Engineering
Systems	
CS 5620	Computer Architecture
CS 5650	High Performance Computing
CS 6610	Parallel Computing
CS 6740	Network Security
CS 7670	Seminar in Computer Systems
CS 7680	Special Topics in Computer Systems
Theory	
CS 6610	Parallel Computing
CS 6750	Cryptography and Communications Security
CS 6800	Application of Information Theory
CS 6810	Distributed Algorithms
CS 7805	Theory of Computation
CS 7870	Seminar in Theoretical Computer Science
CS 7880	Special Topics in Theories of Computer Science

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Computer Science, MSCS—ALIGN Program

MSCS-ALIGN students come from a wide variety of backgrounds—with undergraduate majors ranging from math, biology, history, engineering, and classics. In this program, students have an opportunity to acquire both the knowledge needed to transition into a new career and the practical skills to build the next great app. In this program, students may learn to:

- Develop the ability to recognize and solve problems arising in modern computing
- Assimilate ideas and concepts from theoretical studies and hands-on design and programming
- Acquire skills in software and application design, network infrastructure, and other dynamic and emerging computer science areas

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

Fundamentals		
CS 5001 and CS 5003	Intensive Foundations of Computer Science and Recitation for CS 5001	4
Discrete Structures		
CS 5002	Discrete and Data Structures	4
Object-Oriented Design		
A grade of B or higher is required:		
CS 5004 and CS 5005	Object-Oriented Design and Recitation for CS 5004	4
Other Foundation Courses		
CS 5006	Algorithms	2
CS 5007	Computer Systems	2
Development		
A grade of B or higher is required:		
CS 5500 or CS 5600	Managing Software Development Computer Systems	4
Algorithms		
A grade of B or higher is required:		
CS 5800	Algorithms	4

Electives

Complete 20 semester hours from the following. A minimum of 8 semester hours must be taken from the same specialization.		20
CS 5100 to CS 5850		
CS 6110 to CS 6810		
CS 8674	Master's Project	
CS 8982	Readings	
CS 7990	Thesis	
Specializations		
Artificial Intelligence		
CS 5100	Foundations of Artificial Intelligence	
CS 5335	Robotic Science and Systems	
CS 6110	Knowledge-Based Systems	
CS 6120	Natural Language Processing	
CS 6140	Machine Learning	
CS 7140	Advanced Machine Learning	
CS 7170	Seminar in Artificial Intelligence	
CS 7180	Special Topics in Artificial Intelligence	
Computer-Human Interface		
CS 5340	Computer/Human Interaction	
CS 5350	Applied Geometric Representation and Computation	
CS 6350	Empirical Research Methods	
CS 7140	Advanced Machine Learning	
Database Management		
CS 5200	Database Management Systems	
CS 6140	Machine Learning	
CS 6200	Information Retrieval	
CS 6220	Data Mining Techniques	
CS 6240	Large-Scale Parallel Data Processing	
CS 7270	Seminar in Database Systems	
CS 7280	Special Topics in Database Management	
Game Design		
CS 5150	Game Artificial Intelligence	
CS 5310	Computer Graphics	
CS 5340	Computer/Human Interaction	
CS 5850	Building Game Engines	
CS 7140	Advanced Machine Learning	
Graphics		
CS 5310	Computer Graphics	
CS 5320	Digital Image Processing	
CS 5330	Pattern Recognition and Computer Vision	
CS 5520	Mobile Application Development	
CS 6310	Computational Imaging	
CS 7370	Seminar in Graphics/Image Processing	
CS 7380	Special Topics in Graphics/Image Processing	
Information Security		
CS 5770	Software Vulnerabilities and Security	
CS 6540	Foundations of Formal Methods and Software Analysis	
CS 6740	Network Security	
CS 6750	Cryptography and Communications Security	
CS 6760	Privacy, Security, and Usability	
CS 7580	Special Topics in Software Engineering	
Networks		
CS 5700	Fundamentals of Computer Networking	
CS 5750	Social Computing	
CS 6710	Wireless Network	
CS 6740	Network Security	
CS 6750	Cryptography and Communications Security	
CS 6760	Privacy, Security, and Usability	
CS 7770	Seminar in Computer Networks	
CS 7775	Seminar in Computer Security	
CS 7780	Special Topics in Networks	
Programming Languages		
CS 5400	Principles of Programming Language	
CS 6410	Compilers	
CS 6412	Semantics of Programming Language	
CS 6510	Advanced Software Development	
CS 6515	Software Development	

CS 7470	Seminar in Programming Languages
CS 7480	Special Topics in Programming Language
CS 7570	Seminar in Software Development
Software Engineering	
CS 5610	Web Development
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6530	Analysis of Software Artifacts
CS 6535	Engineering Reliable Software
CS 6540	Foundations of Formal Methods and Software Analysis
CS 6650	Building Scalable Distributed Systems
CS 7575	Seminar in Software Engineering
CS 7580	Special Topics in Software Engineering
Systems	
CS 5620	Computer Architecture
CS 5650	High Performance Computing
CS 6610	Parallel Computing
CS 6740	Network Security
CS 7670	Seminar in Computer Systems
CS 7680	Special Topics in Computer Systems
Theory	
CS 6610	Parallel Computing
CS 6750	Cryptography and Communications Security
CS 6800	Application of Information Theory
CS 6810	Distributed Algorithms
CS 7805	Theory of Computation
CS 7870	Seminar in Theoretical Computer Science
CS 7880	Special Topics in Theories of Computer Science

Program Credit/GPA Requirements

44 total semester hours required
Minimum 3.000 GPA required

Computer Science, Graduate Certificate

The postbaccalaureate certificate is designed to give students a solid foundation in the mathematical and theoretical underpinnings of computer science, including the areas of discrete mathematics, basic programming, data structures, object-oriented programming, algorithms, and computer systems. The goal of the certificate is to provide foundational knowledge in computer science that is valuable in both the workplace for career advancement, as well as to those looking to move into graduate programs within the discipline.

The Postbaccalaureate Certificate in Computer Science will serve as the foundational premasters' courses in the ALIGN program. Students that successfully complete the five certificate courses with a B in each course or better will be eligible to matriculate into the Master of Science in Computer Science program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

CS 5001 and CS 5003	Intensive Foundations of Computer Science and Recitation for CS 5001	4
CS 5002	Discrete and Data Structures	4
CS 5004 and CS 5005	Object-Oriented Design and Recitation for CS 5004	4
CS 5006	Algorithms	2
CS 5007	Computer Systems	2

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Health Informatics

Meet the demand for health informatics professionals

Professionals who understand the relationship between information technology, people, health, and the healthcare system are in short supply. With Northeastern University's interdisciplinary graduate programs in health informatics, you have an opportunity to gain the knowledge and skills needed to use information technology to improve healthcare delivery and outcomes—and to advance your career in this growing field.

Northeastern's health informatics master's degree and certificate programs seek to provide:

- The expertise of both the College of Computer and Information Science (http://www.ccs.neu.edu/about) and Bouvé College of Health Sciences (http://www.northeastern.edu/bouve)
- Faculty (http://www.ccs.neu.edu/graduate/degree-programs/m-s-in-health-informatics/faculty) who are senior leaders in the field
- The ability to communicate effectively with clinicians, administrators, and IT professionals and to understand each of their needs and constraints
- Strong industry connections
- The opportunity to learn from students with backgrounds in healthcare or technology—nurses, pharmacists, physicians, programmers, project managers, analysts, and others
- Flexible course schedules and formats designed to meet the needs of both working professionals and full-time students
- Research opportunities and an academic lead-in to the PhD in Personal Health Informatics (http://phi.ccs.neu.edu)

Whether you want to take on new responsibilities in your current workplace or to launch a new career, Northeastern's graduate degree and certificate programs in health informatics prepare you for leadership and specialist roles in a variety of health-related organizations. And you're ready to make an immediate impact on healthcare.

Programs

Doctor of Philosophy (PhD)

- Personal Health Informatics (p. 96)

Master of Science (MS)

- Health Data Analytics (p. 98)

- Health Informatics (p. 98)
- Health Informatics—ALIGN Program (p. 99)

Graduate Certificate

- Health Informatics Management and Exchange (p. 267)
- Health Informatics Privacy and Security (p. 267)
- Health Informatics Software Engineering (p. 267)

Personal Health Informatics, PhD

Northeastern's Doctor of Philosophy (PhD) in Personal Health Informatics (PHI) is a transdisciplinary doctoral program focused on educating top researchers in the theoretical underpinnings, design, evaluation, and dissemination of consumer- and patient-focused health systems. Personal health technologies are those that non–health professionals interact with *directly*, both in and out of a clinical setting and in various life stages of illness and wellness.

Examples include:

- Assistive technologies that aid persons with disabilities
- Consumer wellness promotion technologies
- Patient education and counseling systems
- Interfaces for reviewing personal health records
- Advanced ambulatory monitoring for supporting health
- Automated elder care systems that monitor health and support independent living
- Social networking systems connecting families and their social and medical support networks

Developing personal health interface technologies requires that professionals have skills and experience designing systems for individual patients and consumers with a wide range of backgrounds in different contexts using a variety of media, while ensuring that fielded technologies are effective, reliable, and responsive to the needs of at-risk and patient populations. Critical skills and knowledge include needs assessment, theories of interface design and health behavior, rapid prototyping and implementation, experimental design with human subjects in challenging settings, and statistical data analysis and validation. Moreover, these skills must be deployed while working with, or leading, transdisciplinary teams.

The interdisciplinary nature of the program targets students who are interested in improving health and wellness using novel technologies that directly impact the lives of consumers and patients. This is a program for students who are not only technically strong but also socially conscious, design oriented, and interested in rigorously evaluating the technologies they imagine and build. The program provides a path for technical students to acquire more experience in the deployment and evaluation of health technologies in the field but also a path for students with health backgrounds to develop the technical skills needed to prototype and assess creative ideas they envision for improving care. The expected length of study is five years after the bachelor's degree.

Admission Requirements

Students will be accepted with either of the following:

- A bachelor's or higher degree in a technical discipline (e.g., computer science or information science, computer systems engineering) with either academic or work experience demonstrating a commitment to working in health.
- A bachelor's or higher degree in a health science discipline (e.g., nursing, medicine, physical therapy, pharmacy, public health) with either some academic course work in technology, such as a course in programming or design, or work experience where the applicant participated in the development, adaptation, or evaluation of consumer- or patient-facing health technology. (Otherwise outstanding applicants without programming skills may be advised to take an introductory programming course prior to entry, and otherwise outstanding applicants without any formal experience working in health settings may be advised to spend some time volunteering in a medical or community health setting prior to entry.)

Applicants will be expected to have:

- A minimum 3.000 undergraduate grade-point average (GPA)
- A minimum total GRE score of 300 or equivalent
- A minimum GRE academic writing score of 3.5
- For international applicants, a minimum TOEFL score of 105

Minimum Academic Standards and Requirements

RESIDENCY REQUIREMENT

The residency requirement will follow the University Graduate Council By-Law policy.

DISSERTATION ADVISING

Each student will have one primary advisor from the personal health informatics doctoral program faculty.

DISSERTATION COMMITTEE

The committee will consist of at least three members: the dissertation advisor, one additional personal health informatics doctoral program faculty member, and one member external to Northeastern who is an expert in the specific personal health informatics topic of research. The dissertation committee shall include experts with both health and technology backgrounds. The dissertation advisor must be a full-time member of the Northeastern University faculty.

QUALIFYING EXAMINATION

The qualifying examination consists of a three-part exam conducted by a committee of three personal health informatics doctoral program faculty members, each overseeing one part of the exam. The research core of the exam is fulfilled with submission of a high-quality paper to a strong peer-reviewed conference or journal. The health component of the exam is fulfilled when the student passes a written exam developed by a faculty member with a health sciences background, and the technical component of the exam is fulfilled when the student passes an exam developed by a faculty member with a technical background. The content of the written exams and the paper topic are developed in consultation with each faculty member.

DEGREE CANDIDACY

A student is considered a PhD degree candidate upon meeting these conditions:

- Completion of core courses with a minimum GPA of 3.000 overall on the core courses
- Completion of the qualifying examination

COMPREHENSIVE EXAM

A PhD student must submit a written dissertation proposal to the dissertation committee. The proposal should identify the research problem, the research plan, and its potential impact on the field. A presentation of the proposal will be made in an open forum, and the student must successfully defend it before the dissertation committee.

DISSERTATION DEFENSE

A PhD student must complete and defend a dissertation that involves original research in personal health informatics.

Curriculum Requirements

REQUIRED AND ELECTIVE COURSES

The curriculum is designed to provide all PhD students with a strong foundation in principles critical to the design and evaluation of personal health interfaces. All students take six core courses (24 semester hours) and the user-interface practicum (1 semester hour). All students must also fulfill the programming fundamentals requirement (4 semester hours) and the statistics fundamentals requirement (4 semester hours), where some flexibility in course selection allows tailoring based on background and experience. Two additional research electives (8 semester hours) are selected based on research interests from the personal health informatics electives list. Students are also expected to participate in the personal health informatics seminar series each semester.

Program Assessment

LEARNING OUTCOMES

This program seeks to produce graduates who are capable of leading and performing independent, new research projects related to personal health informatics and who are well prepared to enter into a number of potential career paths, including industrial research positions, government consultants, or postdoctoral or junior faculty positions in academic institutions in either technology programs or schools of health science, public health, or medicine.

DEGREE OUTCOMES

The dissertation committee evaluates whether the student has produced a significant contribution to personal health informatics research. The process used by the dissertation committee is based on an assessment of the goals and objectives described in the written PhD proposal. Student success can also be measured in the number and quality of publications generated by the research.

IMPROVING EFFECTIVENESS

Publication venues will provide a means to assess the quality of the program, as well as the research projects. External research funding and incoming student quality will be used to measure program strength. In addition, graduates will be asked for feedback concerning their training and program preparation.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examinations (3)
Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

General Requirements

Foundations		
HINF 5200	Theoretical Foundations in Personal Health Informatics	4
Program Design and Development		
CS 5010	Programming Design Paradigm	4
CS 5340	Computer/Human Interaction	4
HINF 5300	Personal Health Interface Design and Development	4
Methods and Statistics		
CS 6350	Empirical Research Methods	4
PHTH 5210	Biostatistics in Public Health	3
Evaluation		
HINF 8982	Readings	1-8
HINF 5301	Personal Health Technologies: Field Deployment and System Evaluation	4
Electives		
Complete 6 to 8 semester hours in the following subject area:		6-8
(Note: Please see faculty advisor for other acceptable elective courses.)		
HINF		

Dissertation

Complete the following (repeatable) course twice:

CS 9990	Dissertation

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Sample Curriculum

Year 1

Fall	Hours	Spring	Hours
HINF 5200	4	CS 5010 or 5520	4
CS 5340	4	CS 6350	4
		Additionally, students should participate in the Personal Health Informatics Usability Evaluation Practicum	1
	8		9

Year 2

Fall	Hours	Spring	Hours
HINF 5300	4	HINF 5301	4
PHTH 5210 (or PHTH 6210 or CAEP 7712 or CAEP 7716)	3	PHI elective	3-4
	7		7-8

Year 3

Fall	Hours	Spring	Hours
HINF 9990	2-4	HINF 9990	2-4
HINF 8982	1-8	PHI elective	3-4
	3-12		5-8

Year 4

Fall	Hours	Spring	Hours
HINF 9996	0	HINF 9996	0
	0		0

Year 5			
Fall	**Hours**	**Spring**	**Hours**
HINF 9996	0	HINF 9996	0
	0		0

Total Hours: 39-52

Health Data Analytics, MS

The digitization of healthcare systems in clinical settings, in combination with the explosion of personal data collection devices, provides the opportunity of using data for revolutionizing approaches to care at all levels with an emphasis on precision medicine and person-centered care. The ability to take advantage of this "Big Data" opportunity, however, requires expertise at the intersection of health informatics, data science, and computational modeling. The Master of Science in Health Data Analytics is designed to prepare students to succeed in this emerging field. This program offers a strong, competency-based curriculum that addresses data analytics ranging from data acquisition from traditional and emerging data streams, data aggregation methods, data mining algorithms, predictive computational modeling, and visualization techniques. Students can expect to amass a broad and deep understanding of the various methods, software tools, and topical expertise needed to discover meaningful patterns in health-related data and effectively communicate their implications to a number of diverse stakeholders. Successful graduates of the Master of Science in Health Data Analytics will be effective practitioners and leaders in the rapidly developing domain of data analytics with a focus on health and healthcare.

The interdisciplinary Master of Science in Health Data Analytics consists of 12 courses, drawn from the College of Computer and Information Science and the Bouvé College of Health Science; a capstone project; and an ongoing series of seminars on topics in health data analytics. Two tracks will be available to matriculating students: standard and research based.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Analytics/Modeling/Statistics		
DA 5020	Collecting, Storing, and Retrieving Data	4
DA 5030	Introduction to Data Mining/Machine Learning	4
HINF 6400	Introduction to Health Data Analytics	3
PPUA 5301	Introduction to Computational Statistics	4
PPUA 5302	Information Design and Visual Analytics	4
Healthcare		
HINF 5102	Data Management in Healthcare	3
HINF 5105	The American Healthcare System	3
HINF 5XXX Predictive Analytics and Modeling [1]		3
Thesis/Capstone		
Complete either Thesis or Capstone:		3
Thesis		
HINF XXXX Health Data Analytics Thesis [1]		
Capstone		
HINF 7701	Health Informatics Capstone Project	

[1] Please see college administrator for course information.

Electives

At least one course must be chosen from the methods list.

Methods		
Complete 3–6 semester hours from the following:		3-6
PHTH 5240	Evaluating Scientific Evidence	
PHTH 6202	Intermediate Epidemiology	
PHTH 6210	Applied Regression Analysis	
PHTH 6440	Advanced Methods in Biostatistics	
CS 6350	Empirical Research Methods	
CAEP 7712	Intermediate Statistical Data Analysis Techniques	
CAEP 7716	Advanced Research and Data Analyses 2	
Other Electives		
Complete 0–4 semester hours from the following:		0-4
ARTG 5330	Visualization Technologies	
ARTG 6320	Design of Information-Rich Environments	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 5300	Personal Health Interface Design and Development	
HINF 6215	Project Management	
HINF 6220	Database Design, Access, Modeling, and Security	
PHTH 5226	Strategic Management and Leadership in Healthcare	
PHTH 5232	Evaluating Healthcare Quality	
PHTH 5234	Economic Perspectives on Health Policy	

Program Credit/GPA Requirements

37 total semester hours required
Minimum 3.000 GPA required

Health Informatics, MS

Northeastern's interdisciplinary Master of Science in Health Informatics was the first MS in the field. The program seeks to prepare students to address the combined clinical, technical, and business needs of health-related professionals. Successful students graduate with the knowledge of how technology, people, health, and the healthcare system interrelate; the ability to use technology and information management to improve healthcare delivery and outcomes; and the skills to communicate effectively among healthcare practitioners, administrators, and information technology professionals.

With approval from the health informatics program director, selected students can substitute one course from the Graduate Certificate in Data Analytics for a technical core requirement in the MS in Health Informatics degree, and up to two more courses from the Graduate Certificate in Data Analytics can be counted as electives for the MS in Health Informatics degree.

Northeastern also offers graduate certificate programs in health informatics. Three certificate programs enable you to choose the one that addresses your specific goals. These programs are listed separately in this catalog:

- Graduate Certificate in Health Informatics Management and Exchange
- Graduate Certificate in Health Informatics Privacy and Security
- Graduate Certificate in Health Informatics Software Engineering

Courses in the certificate program also apply toward master's degree requirements. This gives you the flexibility to complete a certificate and be well on your way to earning a degree if you decide later to continue your education.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in each course.

Core Requirements		
HINF 5101	Introduction to Health Informatics and Health Information Systems	3
HINF 5105	The American Healthcare System	3
HINF 7701	Health Informatics Capstone Project	3
Business Management Core		
Complete two courses from the following:		6
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management	
HINF 6202	Business of Healthcare Informatics	
HINF 6215	Project Management	
HINF 6335	Management Issues in Healthcare Information Technology	
HINF 6240	Improving the Patient Experience through Informatics	
PHTH 5226	Strategic Management and Leadership in Healthcare	
Health Informatics Core		
Complete two courses from the following:		6
HINF 5102	Data Management in Healthcare	
HINF 5110	Global Health Information Management	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 6205	Creation and Application of Medical Knowledge	
HINF 6350	Public Health Surveillance and Informatics	
HINF 6404	Patient Engagement Informatics and Analytics	
HINF 6405	Quantifying the Value of Informatics	
PHTH 5232	Evaluating Healthcare Quality	
Technical Core		
Complete two courses from the following:		6
HINF 6220	Database Design, Access, Modeling, and Security	
HINF 6230	Strategic Topics in Programming For Health Professionals	
HINF 6355	Key Standards in Health Informatics Systems	
PHTH 5210	Biostatistics in Public Health	
PHTH 5202	Introduction to Epidemiology	
One course from the following may count toward the technical core requirement:		
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	
Electives		
Complete two courses from the following. Any course not taken to complete a core requirement may be taken as an elective.		6
HINF 6325	Legal and Social Issues in Health Informatics	
HINF 6330	Emerging Technologies in Healthcare	
HINF 6345	Design for Usability in Healthcare	
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	

Program Credit/GPA Requirements

Minimum 33 total semester hours required
Minimum 3.000 GPA required

Health Informatics, MS—ALIGN Program

Our Master of Science in Health Informatics ALIGN program seeks to prepare students from diverse backgrounds to excel in the health informatics field. ALIGN's custom master's degree curricula are tailored to each student's professional and educational background, allowing successful students to transition into careers in high-demand industries. Learn more at the ALIGN webpage (http://www.northeastern.edu/align).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in each course.

ALIGN Course Work		
Complete one or two courses from the following as assigned during admission:		3-6
HINF 0200	Health and Medicine for Nonclinicians	
HINF 6230	Strategic Topics in Programming For Health Professionals	
Core Requirements		

HINF 5101	Introduction to Health Informatics and Health Information Systems	3
HINF 5105	The American Healthcare System	3
HINF 7701	Health Informatics Capstone Project	3
Business Management Core		
Complete two courses from the following:		6
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management	
HINF 6202	Business of Healthcare Informatics	
HINF 6215	Project Management	
HINF 6335	Management Issues in Healthcare Information Technology	
HINF 6240	Improving the Patient Experience through Informatics	
PHTH 5226	Strategic Management and Leadership in Healthcare	
Health Informatics Core		
Complete two courses from the following:		6
HINF 5102	Data Management in Healthcare	
HINF 5110	Global Health Information Management	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 6205	Creation and Application of Medical Knowledge	
HINF 6350	Public Health Surveillance and Informatics	
HINF 6404	Patient Engagement Informatics and Analytics	
HINF 6405	Quantifying the Value of Informatics	
PHTH 5232	Evaluating Healthcare Quality	
Technical Core		
Complete two courses from the following:		6
HINF 6220	Database Design, Access, Modeling, and Security	
HINF 6230	Strategic Topics in Programming For Health Professionals	
HINF 6355	Key Standards in Health Informatics Systems	
PHTH 5210	Biostatistics in Public Health	
PHTH 5202	Introduction to Epidemiology	
One course from the following may count toward the technical core requirement:		
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	
Electives		
Complete two courses from the following. Any course not taken to complete a core requirement may be taken as an elective.		6
HINF 6325	Legal and Social Issues in Health Informatics	
HINF 6330	Emerging Technologies in Healthcare	
HINF 6345	Design for Usability in Healthcare	
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	

Program Credit/GPA Requirements

39 total semester hours required
Minimum 3.000 GPA required

Information Assurance

Students can apply for admission to two distinct degree programs:

Doctor of Philosophy (PhD) in Information Assurance degree. A research-based, interdisciplinary PhD in information assurance combines a strong security technical foundation with a security policy and social sciences perspective. It seeks to prepare graduates to advance the state-of-the-art of security in systems, networks, and the internet in industry, academia, and government. The interdisciplinary nature of the program distinguishes it from traditional doctoral degree programs in computer science, engineering, or social sciences and makes it unique in the Boston area.

Master of Science (MS) in Information Assurance and Cybersecurity degree. An industry-focused, interdisciplinary Master of Science in Information Assurance and Cybersecurity combines knowledge of information security technology and cybersecurity tools with relevant knowledge from law, the social sciences, criminology, and management. The Master of Science in Information Assurance and Cybersecurity is designed for students focused on cybersecurity careers in companies or government agencies, thus applying their knowledge to their workplaces to assess security threats and manage information security risks and technical and policy controls.

> **MSIA-ALIGN.** Students who have a strong desire to pursue a career in information assurance and cybersecurity but lack a technical background are advised to apply to MSIA-ALIGN. MSIA-ALIGN students enter the ALIGN program with backgrounds in social sciences, business, economics, sciences, and other disciplines. The MSIA-ALIGN courses prepare MSIA-ALIGN students to gain admission to the Master of Science in Information Assurance and Cybersecurity.

Northeastern University designations by the National Security Agency (NSA) and the Department of Homeland Security (DHS):

- Center of Academic Excellence in Information Assurance/Cyber Defense Education, with focus area in Cyber Investigations
- Center of Academic Excellence in Information Assurance Research
- Center of Academic Excellence in Cyber Operations

Programs

Doctor of Philosophy (PhD)

- Information Assurance (p. 101)
- Information Assurance—Advanced Entry (p. 102)

Master of Science in Information Assurance and Cybersecurity (MSIA)

- Information Assurance and Cybersecurity (p. 103)
- Information Assurance and Cybersecurity—ALIGN Program (p. 104)

Graduate Certificate

- Cybersecurity (p. 105)

Information Assurance, PhD

A research-based, interdisciplinary Doctor of Philosophy (PhD) in Information Assurance combines a strong security technical foundation with a security policy and social sciences perspective. It seeks to prepare graduates to advance the state-of-the-art of security in systems, networks, and the internet in industry, academia, and government. The interdisciplinary nature of the program distinguishes it from traditional doctoral degree programs in computer science, engineering, or social sciences and makes it unique in the Boston area.

Students who choose the PhD in information assurance program have a strong desire to purse academic research solving critical cybersecurity challenges facing today's society. The PhD program is a natural path for students in the college's Master of Science in Information Assurance and Cybersecurity (http://www.ccs.neu.edu/graduate/degree-programs/m-s-in-information-assurance)program who want to pursue research and students with bachelor's degrees and an interest in research-focused careers. Students who pursue careers in advancing the state-of-the art of cybersecurity have an opportunity to gain:

- A strong technical foundation in cybersecurity and an interdisciplinary perspective based on policy and social science
- A path to a research-focused career coupled with depth in information assurance research at a leading institution, one of the earliest designees by NSA/DHS as a National Center of Academic Excellence (http://www.nsa.gov/ia/academic_outreach/nat_cae/index.shtml) in Information Assurance Research, Information Assurance/Cyber Defense, and Cyber Operations
- The opportunity to work with and learn from faculty who are recognized internationally for their expertise and contributions in information assurance from Northeastern's College of Computer and Information Science, the Department of Electrical and Computer Engineering, and the College of Social Sciences and Humanities
- Access to research projects at Northeastern's research centers focused on security:
  - The Institute of Information Assurance (IIA) an interdisciplinary research center overseen by both the College of Computer and Information Science and the Department of Electrical and Computer Engineering in the College of Engineering, and the recipient of a National Science Foundation grant to train the country's next-generation cybercorps
  - The International Secure Systems Lab (http://www.iseclab.org), affiliated with Northeastern, a collaborative effort of European and U.S. researchers focused on web security, malware and vulnerability analysis, intrusion detection, and other computer security issues
  - The ALERT Center (http://www.northeastern.edu/alert), where Northeastern is the lead institution, a multiuniversity Department of Homeland Security Center of Excellence involved in research, education, and technology related to threats from explosives

The benefits of the Boston area:

- World-renowned for academic and research excellence, the Boston area is also home to some of the nation's largest Department of Defense contractors and government and independent labs such as MIT Lincoln Lab, MITRE, and Draper Lab

Degree Requirements

The PhD in information assurance degree requires completion of at least 48 semester credit hours beyond a bachelor's degree. Students who enter with an undergraduate degree will typically need four to five years to complete the program, and they will be awarded a master's degree en route to the PhD.

Doctoral Degree Candidacy

A student is considered a PhD degree candidate after completing the core courses with at least a 3.400 grade-point average (GPA) and either publishing a paper in a strong conference or journal or passing an oral exam that is conducted by a committee of three information assurance faculty members and based on paper(s) written by the student.

RESIDENCY

One year of continuous full-time study is required after admission to the PhD candidacy. During this period, the student will be expected to make substantial progress in preparing for the comprehensive examination.

DISSERTATION ADVISING

The doctoral dissertation advising team for each student consists of two information assurance faculty members, one in a technical area. When appropriate, the second faculty advisor will be from the policy/social science area.

DISSERTATION COMMITTEE

A PhD student's dissertation committee consists of the two members of the dissertation advising team plus two others: One is a member of the information assurance faculty, and the other is an external examiner who is knowledgeable about the student's research topic.

COMPREHENSIVE EXAMINATION

A PhD student must submit a written dissertation proposal and present it to the dissertation committee. The proposal should identify the research problem, the research plan, and the potential impact of the research on the field. The presentation of the proposal will be made in an open forum, and the student must successfully defend it before the dissertation committee after the public presentation.

DISSERTATION DEFENSE

A PhD student must complete and defend a dissertation that involves original research in information assurance.

AWARDING OF MASTER'S DEGREES

Students who enter the PhD in information assurance program with a bachelor's degree have the option of obtaining a master's degree from one of the departments participating in the program. To do so, they must meet all of the department's degree requirements.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying exam and area exam
Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

Core Requirement

A cumulative 3.400 GPA is required for the core requirement.

Fundamentals		
CS 5700	Fundamentals of Computer Networking	4
or EECE 7336	Digital Communications	
Software		
CS 5770	Software Vulnerabilities and Security	4
Security and Cyberlaw		
IA 5200	Security Risk Management and Assessment	4
CS 6740	Network Security	4
or CS 6750	Cryptography and Communications Security	
IA 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	4

Electives and Specializations

Complete 28 semester hours from the following:		28
Consult faculty advisor for other acceptable courses.		
Track 1: Network/Communication Security		
CS 6710	Wireless Network	
EECE 5666	Digital Signal Processing	
Track 2: System Security		
CS 5600	Computer Systems	
or EECE 7352	Computer Architecture	
CS 6540	Foundations of Formal Methods and Software Analysis	
IA 6120	Software Security Practices	
Track 3 Policy/Society		
CRIM 7242	Terrorism and International Crime	
CRIM 7246	Security Management	
CRIM 7252	White-Collar Crime	
POLS 7341	Security and Resilience Policy	
General Electives		
CS 5500	Managing Software Development	
CS 6140	Machine Learning	
CS 6200	Information Retrieval	
EECE 7204	Applied Probability and Stochastic Processes	
EECE 7205	Fundamentals of Computer Engineering	
EECE 7337	Information Theory	
EECE 7339	Testing and Design for Testability	
EECE 7350	Software Engineering 1	
EECE 7351	Software Engineering 2	
EECE 7357	Fault-Tolerant Computers	
SOCL 7211	Research Methods	
or CS 6350	Empirical Research Methods	

Dissertation

Complete the following (repeatable) course twice:		
IA 9990	Dissertation	
Complete the following (repeatable) course until graduation:		
IA 9996	Dissertation Continuation	

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.000 GPA required

Information Assurance, PhD—Advanced Entry

A research-based, interdisciplinary Doctor of Philosophy (PhD) in Information Assurance combines a strong security technical foundation with a security policy and social sciences perspective. It seeks to prepare graduates to advance the state-of-the-art of security in systems networks and the internet in industry, academia, and government. The interdisciplinary nature of the program distinguishes it from traditional doctoral degree programs in computer science, engineering, or social sciences and makes it unique in the Boston area.

Students who choose the PhD in information assurance program have a strong desire to purse academic research solving critical cybersecurity challenges facing today's society. The PhD program is a natural path for students in the college's Master of Science in Information Assurance and Cybersecurity program who want to pursue research and students with bachelor's degrees and an interest in research-focused careers. Students who pursue careers in advancing the state-of-the art of cybersecurity have an opportunity to gain:

- A strong technical foundation in cybersecurity and an interdisciplinary perspective based on policy and social science
- A path to a research-focused career coupled with depth in information assurance research at a leading institution, one of the earliest designees by NSA/DHS as a National Center of Academic Excellence in Information Assurance Research, Information Assurance/Cyber Defense, and Cyber Operations
- The opportunity to work with and learn from faculty who are recognized internationally for their expertise and contributions in information assurance from Northeastern's College of Computer and Information Science, the Department of Electrical and Computer Engineering, and the College of Social Sciences and Humanities
- Access to research projects at Northeastern's research centers focused on security:
  - The Institute of Information Assurance (IIA), an interdisciplinary research center overseen by both the College of Computer and Information Science and the department of Electrical and Computer Engineering in the College of Engineering, and the recipient of a National Science Foundation grant to train the country's next generation of cybercorps
  - The International Secure Systems Lab, affiliated with Northeastern, a collaborative effort of European and U.S. researchers focused on web security, malware and vulnerability analysis, intrusion detection, and other computer security issues
  - The ALERT Center, where Northeastern is the lead institution, a multiuniversity Department of Homeland Security Center of

Excellence involved in research, education, and technology related to threats from explosives

The benefits of the Boston area:

- World renowned for academic and research excellence, the Boston area is also home to some of the nation's largest Department of Defense contractors and government and independent labs such as MIT Lincoln Lab, MITRE, and Draper Lab

Degree Requirements

The PhD in information assurance master entry degree requires completion of at least 16 semester credit hours beyond a bachelor's degree. Students also must complete the required core courses.

Doctoral Degree Candidacy

Refer to the information assurance, PhD, overview for admission to candidacy requirements.

RESIDENCY

Refer to the information assurance, PhD, overview for residency requirements.

DISSERTATION ADVISING

Refer to the information assurance, PhD, overview for dissertation advising requirements.

DISSERTATION COMMITTEE

Refer to the information assurance, PhD, overview for dissertation committee requirements.

COMPREHENSIVE EXAMINATION

Refer to the information assurance, PhD, overview for comprehensive examination requirements.

DISSERTATION DEFENSE

Refer to the information assurance, PhD, overview for dissertation defense and completion requirements.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying exam and area exam
Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

Core Requirement

Complete 16 semester hours of approved course work. A cumulative 3.400 GPA is required for the core requirement. Consult your faculty advisor for acceptable courses.

Dissertation

Complete the following (repeatable) course twice:		
IA 9990	Dissertation	
Complete the following (repeatable) course until graduation:		
IA 9996	Dissertation Continuation	

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Information Assurance and Cybersecurity, MSIA

Our Master of Science in Information Assurance and Cybersecurity combines an understanding of information security technology with relevant knowledge from law, the social sciences, criminology, and management. The MS program is designed for working professionals and recent graduates who want knowledge they can apply in their workplaces to assess and manage information security risks effectively.

Learning Outcomes:

• Build core knowledge surrounding computer system security and network security practices

• Plan and implement security strategies to reduce risk and enhance protection of information assets and systems

• Understand legal and ethical issues associated with information security, privacy, and digital rights.

• Enhance communication skills for effective interaction with corporate management on information assurance/cybersecurity-related issues.

Program Requirements

General Requirements

Foundations		
IA 5010	Foundations of Information Assurance	4
Technical Courses		
Complete 8 semester hours from the following:		8
IA 5120	Applied Cryptography	
IA 5130	Computer System Security	
IA 5150	Network Security Practices	
IA 6120	Software Security Practices	
Contextual Courses		
Complete 8 semester hours from the following:		8
IA 5200	Security Risk Management and Assessment	
IA 5210	Information System Forensics	
IA 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
IA 5250	Decision Making for Critical Infrastructure	
Capstone		
IA 7900	Capstone Project/Seminar	4
Electives		
Complete 8 semester hours from the following:		8
IA 5040	Introduction to Cyberspace Programming	
IA 5050	Data Mining in Cyberspace	
IA 5120	Applied Cryptography	
IA 5130	Computer System Security	
IA 5150	Network Security Practices	
IA 5200	Security Risk Management and Assessment	
IA 5210	Information System Forensics	
IA 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	

IA 6120	Software Security Practices
CS 5200	Database Management Systems
CS 5500	Managing Software Development
CS 5600	Computer Systems
CS 5700	Fundamentals of Computer Networking
CS 5770	Software Vulnerabilities and Security
CS 6540	Foundations of Formal Methods and Software Analysis
CS 6710	Wireless Network
CS 6740	Network Security [1]
CS 6750	Cryptography and Communications Security
CS 7805	Theory of Computation
CRIM 7224	Law and Psychology
CRIM 7242	Terrorism and International Crime
CRIM 7252	White-Collar Crime
CRIM 7312	Special Topics in Criminology and Public Policy
PPUA 6503	Public Personnel Administration
PPUA 6505	Public Budgeting and Financial Management
PPUA 6507	Institutional Leadership and the Public Manager
POLS 7341	Security and Resilience Policy

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

[1] This course can only be taken for credit if the student has NOT also taken Network Security Practices (IA 5150). These courses cannot both be taken for credit.

Information Assurance and Cybersecurity, MSIA—ALIGN Program

The innovative ALIGN bridge program to the interdisciplinary Master of Science in Information Assurance and Cybersecurity is designed for students with a BS/BA degree from all backgrounds. During the first semester of year one, students are expected to take foundational courses in cyberspace technologies and discrete mathematics. Upon successful completion of the first semester, students are evaluated for admission to the MS program.

The Master of Science in Information Assurance and Cybersecurity combines computer systems and network security training with knowledge from the social sciences, law, criminology, and management, giving you an opportunity to obtain skills that are in high demand. Through this program, the successful student will learn to:

- Build core knowledge surrounding computer-system security and network practices, as well as relevant knowledge from the social sciences, law, criminology, and management
- Make strategic decisions about security issues and present recommendations to management
- Plan and implement security strategies to reduce risk and protect information assets and systems
- Understand the legal and ethical issues associated with information security, privacy, and digital rights

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

ALIGN Courses		
IA 5001	Cyberspace Technology and Applications	3
IA 5002	Concrete Mathematics	3
IA 5004	Introduction to Cyberspace Programming 1	3
Foundations		
IA 5010	Foundations of Information Assurance	4
Technical Track		
Complete 8 semester hours from the following:		8
IA 5120	Applied Cryptography	
IA 5130	Computer System Security	
IA 5150	Network Security Practices	
IA 6120	Software Security Practices	
Contextual Track		
Complete 8 semester hours from the following:		8
IA 5200	Security Risk Management and Assessment	
IA 5210	Information System Forensics	
IA 5150	Network Security Practices	
IA 5250	Decision Making for Critical Infrastructure	
Capstone		
IA 7900	Capstone Project/Seminar	4
Electives		
Complete 8 semester hours from the following:		8
IA 5040	Introduction to Cyberspace Programming	
IA 5050	Data Mining in Cyberspace	
IA 5120	Applied Cryptography	
IA 5130	Computer System Security	
IA 5150	Network Security Practices	
IA 5200	Security Risk Management and Assessment	
IA 5210	Information System Forensics	
IA 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
IA 6120	Software Security Practices	
CS 5200	Database Management Systems	
CS 5500	Managing Software Development	
CS 5600	Computer Systems	
CS 5700	Fundamentals of Computer Networking	
CS 5770	Software Vulnerabilities and Security	
CS 6540	Foundations of Formal Methods and Software Analysis	
CS 6710	Wireless Network	
CS 6740	Network Security [1]	

CS 6750	Cryptography and Communications Security
CS 7805	Theory of Computation
CRIM 7224	Law and Psychology
CRIM 7242	Terrorism and International Crime
CRIM 7252	White-Collar Crime
CRIM 7312	Special Topics in Criminology and Public Policy
PPUA 6503	Public Personnel Administration
PPUA 6505	Public Budgeting and Financial Management
PPUA 6507	Institutional Leadership and the Public Manager
POLS 7341	Security and Resilience Policy

Program Credit/GPA Requirements

41 total semester hours required
Minimum 3.000 GPA required

[1] This course can only be taken for credit if the student has NOT also taken Network Security Practices (IA 5150). These courses cannot both be taken for credit.

Cybersecurity, Graduate Certificate

The certificate is designed to give students a solid foundation in cybersecurity. In the course work, students have the opportunity to be exposed the basic principles and security concepts related to information systems, to explore issues involved in the security of computer systems, and to explore the techniques used in computer forensic examination. The goal of the certificate is to provide prospective cybersecurity professionals with an entry point to industry positions within eight months from admission and with reduced financial investment.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
IA 5010	Foundations of Information Assurance	4
IA 5130	Computer System Security	4
IA 5210	Information System Forensics	4
Elective		
Complete one of the following:		4
IA 5200	Security Risk Management and Assessment	
IA 5150	Network Security Practices	
IA 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Interdisciplinary

The College of Computer and Information Science features two additional interdisciplinary programs. We partner with the College of Arts, Media and Design to offer the Master of Science in Game Science and Design. We also partner with the College of Social Sciences and Humanities to offer the Graduate Certificate in Data Analytics.

Programs

Master of Science

- Game Science and Design (p. 55)

Graduate Certificate

- Data Analytics (p. 106)

Game Science and Design, MS

The **Master of Science (MS) in Game Science and Design** is a program that seeks to give students a comprehensive understanding of how successful game products are created in a player-centric environment. Focusing on the science of game development, students have an opportunity to learn the design and technological skills needed to build a game and develop a deep understanding of playability and analytics that make products successful in an increasingly competitive marketplace.

The game industry has expanded to include social and mobile gaming; games in health, education, and training; and innovations in play psychology, middleware, graphics tools, game mechanics, game evaluation methods, and advanced artificial intelligence and narrative techniques. It has become an increasingly competitive space.

The selectiveness of the industry and the diversity of the skills required mean that students seeking entry need both broad and deep skills. As an emergent industry using diverse technology and collaborative practices, the game industry needs professionals with interdisciplinary skill sets who can meld knowledge about development with knowledge about evaluation methods and players' behavior and psychology.

Jointly offered by Northeastern's Colleges of Arts, Media and Design and Computer and Information Science (http://www.ccs.neu.edu), the **Master in Science in Game Science and Design** is a one-of-a-kind interdisciplinary program that seeks to prepare students to meet this need by weaving together science and design. This is a two-year, 34-credit-hour program.

The degree offers three concentrations:

- Game analytics: focusing on data analysis of gameplay and other game data to make the game successful
- Game user research: focusing on gauging the user experience to enable designers to develop an enjoyable game experience
- Game design and development: focusing on the design or technical side of game development

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

GSND 5110	Game Design and Analysis	4
GSND 5111	Seminar for GSND 5110	1
GSND 5122	Business Models in the Game Industry	1
GSND 5130	Usability and Empirical User Research	4
or PPUA 5301	Introduction to Computational Statistics	

Specialization Options

Complete one of the following specializations. In consultation with your faculty advisor, declare one specialization option by spring of your first year.

GAME ANALYTICS

Complete three of the following:		12
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
GSND 6350	Game Analytics	
PPUA 5302	Information Design and Visual Analytics	

GAME USER RESEARCH

Complete three of the following:		12
CS 5340	Computer/Human Interaction	
GSND 6320	Psychology of Play	
GSND 6330	Game User Research	
GSND 6340	Advanced Game User Research	

GAME DESIGN AND DEVELOPMENT

Complete three of the following:		12
CS 5150	Game Artificial Intelligence	
CS 5850	Building Game Engines	
GSND 6240	Exploratory Concept Design	
GSND 6250	Spatial and Temporal Design	

Electives

Note: In consultation with your faculty advisor, you may complete two other related courses offered by all options.

Complete two of the following:		8
CS 5150	Game Artificial Intelligence	
CS 5340	Computer/Human Interaction	
CS 5850	Building Game Engines	
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
GSND 6240	Exploratory Concept Design	
GSND 6250	Spatial and Temporal Design	
GSND 6330	Game User Research	
GSND 6320	Psychology of Play	
GSND 6340	Advanced Game User Research	
GSND 6350	Game Analytics	
PPUA 5302	Information Design and Visual Analytics	

Thesis/Project

GSND 7990	Thesis	4
or GSND 7995	Games Project	

Program Credit/GPA Requirements

34 total semester hours required
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours
GSND 5110	4	Concentration elective	4
GSND 5111	1	Concentration elective	4
GSND 5130 or 6301	4		
	9		8

Year 2

Fall	Hours	Spring	Hours
GSND 5122	1	General elective	4
Concentration elective	4	GSND 7990 or 7995	4
General elective	4		
	9		8

Total Hours: 34

Data Analytics, Graduate Certificate

The interdisciplinary Graduate Certificate in Data Analytics is offered through a collaboration between the College of Computer and Information Sciences and the College of Social Sciences and Humanities. The certificate curriculum emphasizes the skills needed to bridge between emerging technological capacities and traditional policymaking processes. The program is designed to provide students with foundational knowledge in data science—including data management, machine learning, data mining, statistics, and visualizing and communicating data—that can be applied to data-driven decision making in any discipline.

For more information on the certificate, refer to the program's website (http://www.northeastern.edu/datascience).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

DA 5020	Collecting, Storing, and Retrieving Data	4
DA 5030	Introduction to Data Mining/Machine Learning	4
PPUA 5301	Introduction to Computational Statistics	4
PPUA 5302	Information Design and Visual Analytics	4

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

College of Engineering

Website (http://www.coe.neu.edu/academics/graduate-school-engineering)

Nadine Aubry, PhD, Dean

Thomas C. Sheahan, ScD, Senior Associate Dean for Academic Affairs

130 Snell Engineering Center
617.373.2711

The Graduate School of Engineering (GSE) offers research and professional degree programs organized around a core curriculum that equips students with a solid foundation for technical and leadership positions in industry organizations, government laboratories, research laboratories, and educational institutions. By involving students in many levels of research, encouraging collaboration across departments, and partnering with outside institutions and organizations globally, Northeastern engineering graduate students have the opportunity to gain a rich and experiential education in their chosen discipline.

Master of Science and doctoral degree programs are offered, as well as numerous graduate certificate programs that can be applied toward master's degree programs for lifelong learning. GSE offers traditional full-time day and part-time evening master's and doctoral degree programs and part-time evening certificate programs. Programs are offered in Boston and at regional campuses. A number of courses and degree programs are also available in a flexible online or hybrid format, which are well suited for distance learners. Innovative programs, such as interdisciplinary degrees, business/entrepreneurship pathways, and the ALIGN program for students without an undergraduate engineering degree, enable students to personalize their learning experience.

Academic Policies and Procedures

Learning Outcomes

Doctor of Philosophy

The PhD programs' student learning outcomes are:

- Ability to use basic engineering concepts flexibly in a variety of contexts
- Ability to formulate a research plan
- Ability to communicate orally a research plan
- Ability to conduct independent research

Master of Science

The MS programs' student learning outcome is:

- Ability to use basic engineering concepts flexibly in a variety of contexts.

Admission Requirements

To be minimally qualified to pursue admission, a candidate must have successfully completed or be in the process of completing an appropriate undergraduate bachelor's degree from a regionally accredited U.S. college or university or its equivalent from a foreign college or university. Any offer of acceptance is contingent upon a candidate's successful completion of an undergraduate bachelor's degree from a regionally accredited U.S. college or university or its equivalent from a foreign college or university.

Application requirements:

- Online application.
- Statement of purpose.
- Professional resumé.
- Transcript(s) from any and all colleges or universities attended evidencing all courses, grades, and credits, as well as any diploma(s) or provisional certificate(s) evidencing that degree(s) have been conferred.
- Two letters of recommendation.
- GRE scores are required of most applicants. For complete information on this requirement, visit the Graduate Admissions website. (http://www.coe.neu.edu/degrees/graduate-admissions)
- TOEFL or IELTS scores are required of most applicants whose native language is not English. For complete information on this requirement, visit the Graduate Admissions website (http://www.coe.neu.edu/degrees/graduate-admissions).

Cooperative Education Policies

The College of Engineering Graduate Cooperative Education Program (co-op) is one option for experiential learning and is available to selected students enrolled full-time at Northeastern University in a degree-granting program. Students registered only in a graduate certificate program are not eligible.

The goals of cooperative education are to:

- Apply knowledge and skills in new, authentic contexts
- Develop new knowledge and skills
- Integrate and use the deepened knowledge and skills in your academic programs
- Reflect on and articulate how you used your knowledge and skills, how you gained new knowledge and skills, and how "theory and practice" work together

Students who wish to participate in co-op must meet the eligibility requirements and follow the guidelines that follow. Co-op is not guaranteed for any student; students must compete and be selected for a limited number of co-op opportunities. These guidelines apply to all graduate students in the College of Engineering.

Eligibility Requirements

1. Students must successfully complete Career Management for Engineers (ENCP 6000) or Introduction to Cooperative Education (ENCP 6100) or Introduction to Cooperative Education (EECE 6000)) (depending on their major). Students MUST meet all co-op eligibility requirements to enroll in Career Management for Engineers (ENCP 6000) or Introduction to Cooperative Education (ENCP 6100)). A complete list of requirements is found on the Graduate School of Engineering website (http://www.coe.neu.edu/co-op-advantage/graduate-co-op).
2. To be eligible for co-op, College of Engineering graduate students must be:
   - Enrolled full-time at Northeastern University
   - Meet the minimum GPA and minimum semester-hour requirements for their program described in the table below, as applicable
   - Meet all English-language requirements described in the table below, as applicable
   - Have no disciplinary or academic probation issues and no incomplete courses (i.e., no I grade in their records)
   - Have at least one term left in their program after completing co-op (i.e., students must return to Northeastern to take courses for at least one term prior to graduating)
   - Have a valid I-20 (for international students)
3. Co-op performance standards encourage professional and ethical behaviors throughout the co-op process and clarify procedures required for continued success of our students and the co-op program. The College of Engineering Co-op Performance Standards are communicated to all students in the Career Management for Engineers (ENCP 6000) / Introduction to Cooperative Education (ENCP 6100) / Introduction to Cooperative Education (EECE 6000) course as part of their preparation for the first co-op experience. The standards establish co-op professional expectations of the student throughout the co-op search process and during the co-op term and address co-op related issues that may involve performance. In the event that a situation arises that requires special consideration, the College of Engineering Co-op Standing Committee may be consulted.
4. Students who are dismissed from or resign from a co-op job for circumstances under their control will receive a U (unsatisfactory) grade for co-op work experience and be ineligible for other future co-op experiences.
5. Students must receive academic and co-op advisor approval prior to accepting a placement.

Electrical and Computer Engineering

GPA >	3.2
Minimum TOEFL requirement	90
Minimum IELTS requirement	7
Note: If below TOEFL/IELTS requirement at matriculation, a new TOEFL/IELTS meeting requirement is needed.	
Required preparation courses	ENCP 6100 or EECE 6000
Minimum number of semester hours completed	16 SH

Bioengineering, Chemical Engineering, Civil Engineering, Engineering and Public Policy, Environmental Engineering, Industrial Engineering, Data Analytics, Operations Research and Mechanical Engineering

GPA >	3.2
Minimum TOEFL requirement	95
Minimum IELTS requirement	7
Note: If below TOEFL/IELTS requirement at matriculation, a new TOEFL/IELTS meeting requirement is needed.	
Required preparation course	ENCP 6100
Minimum number of semester hours completed	16 SH

Computer Systems Engineering, Energy Systems, Engineering Management, Information Systems, Sustainable Building Systems, and Telecommunication Systems Management

GPA	Student must be in good academic standing
Minimum TOEFL requirement	Student must be in good academic standing
Minimum IELTS requirement	Student must be in good academic standing
Required preparation course	ENCP 6000
Minimum number of semester hours completed	16 SH

Guidelines

1. For the purposes of these guidelines, internships, practicums, clinicals, cooperative education, residencies, or similar programs, are all treated as a co-op and are not considered separate experiences in the Graduate School of Engineering. See below for a special note for international PhD student internships only (NOT part of the co-op program).
2. Students may not hold a graduate stipend assistantship at the university during the semesters planned for co-op.
3. Students may participate in co-op activities with a single company for a four-, six-, or eight-month period. The total duration of co-op cannot exceed eight months or be shorter than four months. Co-ops are aligned with academic terms (fall, spring, and full summer or summer 1 and summer 2). For purposes of determining the length of a co-op, it is based on the terms participated in—a co-op in any one term is a four-month co-op (full summer, fall, or spring); six-month co-ops are spring and summer 1 or summer 2 and fall; eight-month co-ops are two consecutive terms (spring and full summer or full summer and fall); fall and spring co-op is not allowed.
4. Students on four-month co-op assignments are allowed to have their co-op extended to a maximum of eight months (aligning with terms as stated above (fall and spring co-op is not allowed), provided they have approval from their academic and co-op advisor.
5. Co-ops are required to be full-time (35+ hours per week) and, thus, students are allowed to take at most one course during the fall and

spring semesters while participating in co-op activities; students are required to seek approval from their co-op coordinator prior to registering for a course during a fall or spring co-op term. Students participating in co-op during the full summer are only allowed to take a single course over the entire summer (i.e., a full summer, summer 1, or summer 2, not one in each period); students are required to seek approval from their co-op coordinator prior to registering for a course during a summer co-op term.

6. Students are permitted to participate in one co-op experience as a graduate student. A student who in the process of seeking a cooperative education experience and is disqualified because of violation of co-op performance standards described in guideline number 3 above is ineligible to seek a future cooperative education experience. In other words, the student forfeits the opportunity to participate in co-op.
7. Students who wish are allowed to create their own co-op placement outside of NUcareers but must meet all the requirements and follow all the guidelines.
8. Final decision regarding any exceptions to the above requirements needs to be approved by the co-op faculty of the appropriate program.

Seattle Campus MSIS Students Only

Seattle multidisciplinary graduate engineering students only are permitted to participate in a second co-op experience. In addition to the collegewide graduate co-op eligibility requirements and guidelines, the supplemental second co-op must additionally meet the following requirements:

1. The student must obtain the second co-op on their own, without access to the NUcareers co-op database.
2. Total co-op length for the two co-op experiences combined cannot exceed eight months.
3. The first and second co-op experiences may not occur in consecutive fall and spring terms.
4. Students must receive academic advisor and faculty co-op coordinator approval prior to initiating a search for a second co-op position and also before accepting a second co-op position.

International PhD Student Internships

An internship at Northeastern is a special case of experiential learning that applies only to international PhD students. Like co-op, it is classified as Curricular Practical Training (CPT) for F-1 visa holders or pre-Academic Training (pre-AT) for J-1 visa holders. An internship must be integral to a student's research or dissertation. As such, the student's research or dissertation would suffer greatly without this experience. Generally, because of the close relationship to the student's research or dissertation, internships are arranged by the student's faculty advisor. Further, it is incumbent upon the faculty advisor to sign and verify that this experience is integral to the student's dissertation or research as part of the CPT approval process, allowing the student to have this experience. Paid or unpaid internships have the same requirements. Internships are never authorized in a student's final semester. CPT internship requests must be approved by the student's academic advisor, department chair, and the Graduate School of Engineering.

Internships, Co-op, and Pre-OPT

A position that a student finds on their own in a field related to their program of study, to provide funding during the summer, or to supplement their income does not qualify for internship CPT authorization, though the position might qualify as a co-op or Pre-OPT experience—provided the student meets all the qualifications for the relevant authorization. Like co-op, internships are not part of a jobs program, even if they do provide experience that would be beneficial to employment after graduation. The key is that any internship must have a very direct and strong relationship to the student's research or dissertation.

Online and Video Streaming Examination Policy

Exam Administration

Students who are enrolled in online and video-streaming sections may be required to have their exams proctored. If a proctor is required, it is the student's responsibility to find a proctor and then have the proctor approved by the Graduate School of Engineering. Students must make arrangements for an exam proctor following the proctor application guidelines. The Graduate School of Engineering reserves the right to reject any proctor application if the guidelines are not followed.

Video-streaming students living within 30 miles of their home campus (Boston, Charlotte, Silicon Valley, or Seattle) and who are enrolled in video-streamed sections may be strongly encouraged by the faculty to take exams at their home campus if there is a campus designee to provide proctoring services. In cases where a student is unable to travel to campus for exams, a proctor can be used.

For successful proctoring, the following responsibilities are delineated.

Student Responsibilities

Students must make arrangements for a proctor. Students are required to complete and submit a Proctor Application form to the Graduate School of Engineering office by the end of the third week of class.

Proctor Responsibilities

The proctor is responsible for administering exams to the students per the instructor's directions and in accordance with the Academic Honesty and Integrity Policy in order to maintain the security and integrity of the exam process.

Faculty Responsibilities

To administer each exam, the instructor will make arrangements for the exchange of exam materials with the proctor.Once a proctor is approved, the faculty is in charge of coordinating and interacting with the proctor.

Course Registration and Withdrawal

Overview

Students must follow their program of study curriculum as published in this *University Graduate Catalog* (2012 and beyond), or the *Graduate School of Engineering Student Guide and Catalog* (prior to 2012), for the year in which they matriculate. Any change in the course work or program requirements must be approved by the student's program advisor and/or the department. Additionally, students must complete any preparatory courses stipulated at the time of admission within the stated time frame.

Registration in classes is mandatory to maintain an active status with the university. Students must be registered in all courses for a given term prior to the university course add deadline. Students should not register for an excessive number of courses or for multiple sections of the same course with the intention of dropping half or more of the courses during the first week of classes.

Students must be registered in their last semester of study. Students finishing their requirements in the summer semester must be registered either in the full summer, summer 1, or summer 2 term.

Any student who is financially withdrawn by Student Accounts prior to the start of any given semester will not be permitted to register for that semester until he or she rectifies the outstanding financial obligation.

Due to last-minute scheduling changes, the Graduate School of Engineering must occasionally substitute faculty or change class schedules after the registration period has begun. Any student registered for the original course will automatically be registered for the updated section should no major schedule conflicts be apparent. Otherwise, the graduate school or the department will contact all affected students for alternatives.

Northeastern University reserves the right to cancel, postpone, combine, or modify any class.

Course Selection

Full-time students (domestic and international) in the Graduate School of Engineering must register for classes on an ongoing basis and carry a minimum of 8 semester hours of course work per semester. Any student who is appointed to a stipended graduate assistantship (SGA) is considered full-time for the term(s) of appointment if enrolled for a minimum of 6 semester hours.

All graduate students who are registered for Dissertation, Dissertation Continuation, Thesis Continuation, PhD Candidacy Preparation, PhD Exam Preparation, or a zero-semester-hour Research course are considered full-time. Registration in these courses is restricted to students who qualify for registration in these courses.

The graduate school does not require part-time students to be enrolled for a certain minimum number of semester hours in any term. However, part-time students who are not enrolled for more than one term (excluding summer terms) should take a leave of absence from the university to maintain active student status to keep their student account active.

The maximum number of semester hours approved for a student in each term varies by the degree program. However, a student can petition his or her program advisor to request permission to register for more than the allowed maximum number of semester hours for a given term. Normally, no more than 9 semester hours (inclusive of transfer credits and advanced standing for MS programs) may be taken outside the College of Engineering.

Students should formulate a program of study in consultation with their assigned program advisor at the beginning of their program, during fall or spring orientation. Students should preselect courses whenever possible and plan to take them when offered, maintaining flexibility with alternate courses in mind. Courses other than the required courses are offered based on demand and are subject to faculty availability. Not all courses are offered every year; however, the graduate school will do everything possible to assure continuity of programs and permit students to make continuous progress toward earning their degrees.

Students who need assistance with course selection, course sequencing, waivers, and/or transfer credits should contact their academic advisor or Graduate Student Services in the Graduate School of Engineering.

MS Thesis and Thesis Continuation

Master's degree students who are completing a thesis must register for a total of 8 semester hours of Thesis. Students who have not completed their thesis but have already registered for the required number of thesis hours, and have no remaining course work to complete the degree, may register for Thesis Continuation in their last semester (including summer term) to maintain full-time status. There is a 1-semester-hour tuition charge for Thesis Continuation. Thesis Continuation may be taken only once.

During graduation clearance, the Graduate School of Engineering will retroactively register students who fail to register correctly for Thesis Continuation. Once these retroactive registrations are posted on a student's record, Student Accounts will send a tuition bill to the student.

Dissertation and Dissertation Continuation

Once program requirements are met for the PhD candidacy, PhD candidates must register for two consecutive semesters (may include the summer term) of Dissertation (xxxx9990). Candidates must then register for Dissertation Continuation in each subsequent semester (excluding the summer term) until the dissertation is complete and approved by the Graduate School of Engineering. Students completing their dissertation in the summer term must register for Dissertation Continuation in the summer term. There is a 1-semester-hour tuition charge for Dissertation Continuation.

During graduation clearance, the Graduate School of Engineering will retroactively register students who fail to register for the correct sequence of Dissertation and/or Dissertation Continuation. If tuition is owed by the student once these retroactive registrations are posted on a student's record, Student Accounts will send a tuition bill to the student.

Attendance Policy

In each term, continuing students are expected to be on campus by the first day of classes and online students are expected to log-in and stay attentive starting from the first class of each term. Course instructors are not expected to make accommodations for students who arrive after the first day of classes. Students who do not attend their class during the first week of a semester risk being dropped out of the course. Students should not expect that they will be added to the classes after the university course add deadline.

Academic Standards and Degree Requirements

Academic Requirements

In order to earn a degree in the graduate program in which a student is enrolled, he or she must complete all program and departmental requirements in a satisfactory manner.

A student must attain a cumulative grade-point average (GPA) of 3.000 or higher with no more than 8 semester hours below the grade of B– in all courses applied toward that degree and exclusive of any prerequisite courses required of students admitted provisionally to their program. A student must also earn a grade of C or higher in all required core courses. Please note that *individual programs may have additional requirements.*

Prerequisite Courses/Undergraduate Courses

Students are not awarded credit toward graduate degree requirements for prerequisite courses unless expressly stated by the student's academic department. Students may occasionally be permitted by their advisor to take undergraduate courses. However, undergraduate courses do not count toward a graduate degree and may affect a student's eligibility to receive federal financial aid. Undergraduate courses do not count toward the graduate-level course load requirement for full-time students.

Pass/Fail Grading Policy

The Graduate School of Engineering does not allow College of Engineering (COE) graduate students to elect a pass/fail grading scheme for courses normally letter graded.

Degree Conferral

A degree is awarded at the end of the term (fall, spring, or summer) in which the final requirement for the degree is satisfied.

Academic Probation (Full-Time Students)

STUDENT'S ACADEMIC STANDING

Academic standing at Northeastern University is determined by a student's cumulative GPA. All graduate students are expected to maintain a cumulative GPA of 3.000 or higher each term to remain in good academic standing and to progress toward graduation. Students falling below a cumulative GPA of 3.000 are placed on academic probation for each academic term in which the cumulative GPA is below 3.000. This will be noted on the student's unofficial transcript.

ACADEMIC PROBATION POLICY

Academic probation is a period of time when a student must address and remediate academic deficiencies.

A student placed on academic probation will receive a written notification by the Graduate School of Engineering (hereafter referred to as the graduate school). The student's academic advisor will also receive notification of the student's probationary status. An academic probation action plan to clear the deficiency must be developed by the student and the student's academic advisor. It is the student's responsibility to complete an action plan (with input from the advisor) that documents how the deficiency will be remediated. This action plan must be signed by the academic advisor and the student, and a copy must be submitted to the graduate school as soon as possible and no later than seven business days from the start of the next academic term. If the action plan is not received by this deadline, the graduate school will cancel the student's course registration(s). *Failure to file a complete and meaningful action plan may be cause for dismissal from the program.* The graduate school reserves the right to reject or change the action plan.

DISMISSAL FROM PROGRAM

A student (part-time or full-time) placed on academic probation for a cumulative GPA of less than 3.000 will have one academic term to raise the cumulative GPA greater than or equal to 3.000. Students whose cumulative GPA is below 3.000 for *two consecutive* terms in which they took courses for credit (excluding Career Management for Engineers (ENCP 6000) or Introduction to Cooperative Education (ENCP 6100), if taken) will automatically be dismissed from their degree program at the end of the second term. Students in this situation may submit an academic dismissal appeal plan to the graduate school to request a final one-term extension. In this case, the student may submit an appeal to the associate dean of the graduate school as per the university appeals process.

Students being dismissed from their program will receive a written notification from the Graduate School of Engineering.

APPEALS PROCESS

A student may appeal a dismissal from his or her program of study due to failure to achieve academic standards set forth in this academic probation policy. To initiate an appeal, the student must send a written request to the associate dean of the graduate school detailing the reasons the student is appealing the dismissal. The written request must be signed by the student, and the appeal must be received by the Graduate School of Engineering within 30 business days from the day the student received written notification of dismissal. The graduate school will respond to the appeal within 10 business days of the date of receipt.

Academic Probation (Part-Time Students)

Students in official part-time status with the University are considered on academic probation if the cumulative GPA is below 3.000 after completion of 8 semester hours. Part-time students must raise the cumulative GPA to 3.000 or higher after completion of 8 additional semester hours to regain good academic standing status.

If the student's cumulative GPA remains below 3.000 after completion of 16 semester hours, the student will be dismissed from the degree program. The student may appeal to attempt an additional final 8 semester hours to raise the cumulative GPA to 3.000 or higher. The appeal is reviewed by the academic probation appeals committee for the student's degree program. If denied, the academic dismissal stands.

Course Repeat/Course Substitution Policy for Students on Academic Probation

The Graduate School of Engineering allows students to repeat (or substitute) a total of up to 8 semester hours of course work beyond stated minimum degree requirements in order to attain the required cumulative 3.000 GPA for good academic standing.

COURSE REPEAT

When the appropriate course is available, courses may be repeated once in order to earn a better grade. In all cases, the most recent grade earned in a course is the one used in calculating the overall GPA; however, previous grades remain on the transcript with a note that the grade is "excluded." This means that the course is excluded from the GPA and earned credit calculation. Students must obtain approval from their academic advisor and the Graduate School of Engineering prior to repeating a course. Students are required to pay normal tuition charges for all repeated course work.

Within the above limitations for extra or repeated courses, a student must repeat any required core course in which he or she earns a grade below C. Individual programs may have additional requirements.

COURSE SUBSTITUTION

In cases where repeating a course is not possible, a student may petition to substitute one course for another they have already taken, as long as the course content is significantly similar and is not a core required course.

The student's academic advisor, graduate school, and in some cases the graduate director of the student's department must approve of the substitution. If approved, the grade in the new course taken will be included in the GPA calculation, and the first course taken will remain on the transcript with a note that the grade is "excluded" from the GPA and earned credit calculation. Students are required to pay normal tuition charges for all substituted course work.

Course Repeat Policy for Students in Good Academic Standing

Students who are in good academic standing may repeat up to 8 semester hours of course work in order to earn a better grade. A course may only be repeated once.

In all cases, the most recent grade earned in a course is the one used in calculating the overall GPA; however, previous grades remain on the transcript with a note that the grade is "excluded." This means that the course is excluded from the GPA and earned credit calculation. Students must obtain approval from their academic advisor and the Graduate

School of Engineering prior to repeating a course. Students are required to pay normal tuition charges for all repeated course work.

Course substitution is not an option for students in good academic standing.

Administrative Procedures

Husky Email

University communications will always be sent to the student's Husky email address. Students are responsible for checking their Husky email account email regularly.

Petitions

Overview

Petition procedures described below are required in all cases so that the Graduate School of Engineering may maintain a complete and accurate record for all students. All petitions, unless otherwise noted, must be formally made on a Graduate School of Engineering petition form and approved by a student's academic advisor, department graduate director (if applicable), and by the Graduate School of Engineering. Other approvals may be required as stipulated by the graduate school upon petition review. Students should refer to the Graduate School of Engineering (http://www.coe.neu.edu/academics/graduate-school-engineering) website for additional instructions.

Elective Outside of the Approved Program Curriculum

Courses approved for each degree program are found in the *Northeastern University Graduate Catalog.* Students must follow the curriculum of their program of study published in the year in which they matriculate. If a student wishes to take a course that is not on the list of approved courses for his or her program, the student must request permission from the academic advisor to take the course *prior to* registering for that course. Failure to obtain permission to take a course that is not part of the approved curriculum, as listed in the catalog, may result in that course not counting toward the student's graduate degree. The petition must be submitted to the Graduate School of Engineering for review. Final decision on all the requests made by a petition form rests with the Graduate School of Engineering.

Note: Students enrolled in a PhD program are not subject to this requirement. Course selection is considered a matter among the student, academic advisor, and department.

Course Waiver

A student may petition to waive any core course (also known as a required course) when he or she has completed equivalent or similar course work elsewhere. The student must submit a completed petition form along with a course description and an official transcript from the institution where he or she completed the course.

Note: Course waivers *do not* decrease the number of required semester hours in any program of study. Submission of a waiver petition does not guarantee a waiver. All waiver petitions are subject to review by the academic advisor, department graduate director (in applicable cases), and the Graduate School of Engineering. The waived course must be replaced by an advisor-approved course.

Extension of Time Limit to Complete Program

All Northeastern University graduate course credits earned in a program of study, or accepted for transfer credit, are valid for a maximum of seven years. To request an extension, students may submit a petition to their academic advisor, including the reason(s) for the request, an intended course of action, and length of time needed to complete degree requirements.

In the case of the Doctor of Philosophy degree, after the establishment of degree candidacy, a maximum of five years is allowed for the completion of degree requirements. To request an extension, students may submit a petition to their academic advisor, including the reason(s) for the request, an intended course of action, and length of time needed to complete degree requirements.

Change in Status (Full-Time, Part-Time)

Students may petition to change their student status from full-time to part-time study within the same program by filing a petition form, signed by their program advisor, graduate program director (in some departments), and submitted to the Graduate School of Engineering. In all cases, students who hold an assistantship, or whose department requires full-time students to complete a project or thesis, must have departmental approval to change status.

Students who wish to change status from part-time to full-time study within the same program must have completed a minimum of 8 semester hours of course work with a minimum 3.000 grade-point average (GPA). Students in this case must submit a petition to change status to their advisor or departmental graduate officer for approval.

Students should discuss the financial implications of changing their student status with the Office of Student Financial Services.

International students are subject to the rules governing their immigration status and should consult with an advisor in the Office of Global Services before filing a status change petition.

Change in Degree Concentration

A student who wishes to change degree concentration within the same program must submit a completed Change of Degree Program/ Concentration form to the program advisor of the new concentration —and, in some cases, to the chair of the graduate committee of their department—for approval. The form must then be forwarded to the Graduate School of Engineering for final review and processing. Students should refer to the Graduate School of Engineering (http://www.coe.neu.edu/academics/graduate-school-engineering) website for additional instructions.

Change in Degree Program

A student who wishes to change his or her degree program must apply for admission to the desired program. This means a new online admission application must be submitted. The application fee is waived. *If admitted*, the student must submit a completed Change of Degree Program form to the advisor of the new program. The form must then be forwarded to the Graduate School of Engineering for final review and processing. Students should refer to the Graduate School of Engineering (http://www.coe.neu.edu/academics/graduate-school-engineering) website for additional instructions.

Change in Degree Level

A student who wishes to change the degree level from MS to PhD must apply for admission to the PhD program. This means a new online admission application must be submitted. The application fee is waived. *If admitted*, the student must submit a completed Graduate School of Engineering Change of Degree Level form to the director of the PhD program. The form must then be forwarded to the Graduate School of Engineering for final review and processing. Students should refer to the

Graduate School of Engineering (http://www.coe.neu.edu/academics/graduate-school-engineering) website for additional instructions.

A student who wishes to change the degree level from PhD to MS *within the same degree program* need not submit a new online application but must submit a Change of Degree Level form to the academic advisor —and, in some departments, to the chair of the graduate committee —for approval. If approved, the Change of Degree Level form must then be submitted to the Graduate School of Engineering for final review and processing. Students should refer to the Graduate School of Engineering (http://www.coe.neu.edu/academics/graduate-school-engineering) website for additional instructions.

Bioengineering

Website (http://www.bioe.neu.edu)

Lee Makowski, PhD
Professor and Chair

206 Interdisciplinary Science and Engineering Complex
617.373.3006
l.makowski@northeastern.edu

Jeffrey Ruberti, PhD
Professor and Graduate Director

206 Interdisciplinary Science and Engineering Complex
617-373-3984
j.ruberti@northeastern.edu

Shiaoming Shi, PhD
Assistant Teaching Professor and Master of Science Advisor

563 Holmes Hall
617-373-8743
s.shi@northeastern.edu

The Department of Bioengineering offers a **Master of Science (MS) and a Doctor of Philosophy (PhD) in Bioengineering**. The MS and PhD degree programs are only offered as full-time programs.

Candidates pursuing an MS or PhD are able to select thesis topics from a diverse range of faculty research. New graduate students may learn about ongoing research topics from individual faculty members, faculty websites, and bioengineering seminars.

Graduate Certificate Options

Students enrolled in a master's degree in bioengineering have the opportunity to also pursue one of the many engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering Leadership Program (p. 204) in combination with the MS degree.

Programs

Doctor of Philosophy (PhD)

- Bioengineering (p. 113)
- Bioengineering—Advanced Entry (p. 120)

Master of Science in Bioengineering (MSBioE)

- Bioengineering (p. 122)

Bioengineering, PhD

Our interdisciplinary Doctor of Philosophy (PhD) program in bioengineering draws on faculty across the university and reflects the significant strengths of bioengineering research in multiple areas. Students accepted to the bioengineering program will undertake a rigorous core curriculum in basic bioengineering science followed by an immersion track curriculum. There are currently eight tracks from which to choose:

- Track 1: Biomedical Imaging and Signal Processing
- Track 2: Biomechanics and Mechanobiology
- Track 3: BioMEMs/BioNANO
- Track 4: Biochemical and Bioenvironmental Engineering
- Track 5: Motor Control
- Track 6: Biocomputing
- Track 7: Cell and Tissue Engineering
- Track 8: General Bioengineering Studies

Biology can inspire engineering. Increasingly, discoveries in the life sciences reveal processes, complexity, and control without analogy in the limited world of traditional engineering. Current methods of producing nanoscale control over molecules cannot reproduce the organization found in even the simplest organisms. Energy capture, robust control, remediation, and self-assembly are all employed with efficiency unparalleled by anything in today's laboratories. At the same time, traditional engineering disciplines struggle to find new and complex challenges. The last 50 years of basic life science research have gradually peeled the layers of complexity from biological processes, unmasking the fundamental underpinnings on which biological systems are constructed. Bioinspired engineering has the potential to transform the technological landscape of the 21st century. Astonishingly, it represents merely one of the myriad opportunities presented at the interface of biology and engineering.

The field of bioengineering is broad and includes all research at the interface of engineering and biology—this includes bioprocesses, environmental microbiology, biomaterials and tissue engineering, bioelectricity, biomechanics, biomedical and biological imaging, nanotechnology in medicine and the environment, and engineering design for human interfacing. At Northeastern, bioengineering PhD students have an opportunity to be trained to appreciate advances in bioengineering across a wide range of disciplines while they perform highly focused and cutting-edge bioengineering research with one of our many core or affiliated faculty members.

Degree Requirements

Completion of the PhD degree requires students to successfully complete the following requirements:

- **Curriculum:** The curriculum comprises a strong fundamental, broad core of courses that is then coupled with one of a series of available tracks for depth in a particular field of study. The detailed course requirements are outlined below.
- **Qualifying exam (written and oral):** To qualify to continue in the PhD program, students must pass the bioengineering comprehensive qualifying examination, which comprises the synthesis of knowledge derived from the core curriculum and current literature presented in the form of an R21 NIH-style proposal. Successful oral defense

of the proposal is required to pass the exam as well as satisfactory research progress and satisfactory academic standing. Details of the formal qualification exam procedure and timing are available in the bioengineering office and may be requested electronically from the graduate director. The qualifying examinations (written and oral) must be successfully completed within three years of entry.

- **Qualifying examination committee:** The qualifying examination committee is composed of a minimum of three members, two of whom must be selected from the list of bioengineering-affiliated faculty. In addition, one of the two affiliated faculty must have a primary appointment in the College of Engineering. The student's primary advisor may not sit on the qualifying exam committee.
- **Dissertation committee:** The dissertation committee is composed of a minimum of three members, two of whom must be selected from the list of bioengineering-affiliated faculty. In addition, one of the two affiliated faculty must have a primary appointment in the College of Engineering. The student's primary advisor should be a member of and chair the dissertation committee.
- **Area exam (dissertation prospectus/proposal):** PhD students must submit a "dissertation proposal" to their dissertation committee in the form of an R-21 NIH-style research plan and successfully defend the research plan in the form of an open presentation to their dissertation committee. The area exam should be completed as soon as is practical after successful completion of course work and qualifying exams.
- **Dissertation:** PhD candidates must satisfactorily complete and defend a dissertation describing original research in bioengineering in an open presentation to their dissertation committee.
- **Dissertation course requirements:** After achieving PhD candidacy, the doctoral candidate, in consultation with his or her research advisor, must register in two consecutive semesters (may include full summer term) for Dissertation (BIOE 9990) . Upon completion of this sequence, the student must then register for Dissertation Continuation (BIOE 9996) in every semester (in each fall and spring term and also in the summer term if summer is the student's last semester) until the dissertation is completed. Students may not register for Dissertation Continuation (BIOE 9996) until they fulfill the two-semester sequence of Dissertation (BIOE 9990) .

  To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Exam Preparation—Doctoral (BIOE 8960) , can be taken if needed to fulfill the full-time course registration requirement. Exam Preparation—Doctoral (BIOE 8960) is an individual instruction course, billed at one semester hour, and graded S or U. Exam Preparation—Doctoral (BIOE 8960) does not have any course content, and students must register in a section for which their research advisor is listed as the "instructor."

For students possessing a baccalaureate in a suitable quantitative or technical field, the required course distribution is shown in the table below.

Requirements	Credits
Required core courses	24 SH
Required and elective track courses	24 SH
Advanced seminar (register and complete four semesters)	0 SH
Dissertation	0 SH
Minimum semester hours required	**48 SH**

The core emphasizes the breadth of topics that our graduates must appreciate as internationally competitive bioengineers. It utilizes existing courses within the College of Engineering as well as introducing new/external courses that are necessary and will be developed.

Track 1: Biomedical Imaging and Signal Processing

TRACK MANAGERS: DANA BROOKS AND DENIZ ERDOGMUS

The biomedical imaging and signal processing track reflects Northeastern University's outstanding research profile in various aspects of biological and biomedical imaging and image processing and signal processing. This is evidenced by the Gordon Center for Subsurface Sensing and Imaging Systems, the Center for Communications and Digital Signal Processing Research, and the strong externally funded active research groups and faculty whose interests lie at the intersection of imaging, signal processing technologies, and biological and medical applications.

The courses listed under program requirements concentrate largely on general mathematical methods for signal and image processing and image formation and on image acquisition modalities and applications. Research in this area takes place at the intersection of these technical streams, and students completing the track will have a sufficiently strong background in the component areas to be able to carry out high-quality research efforts. Bioengineering PhD candidates may complete this track by taking at least two of the restricted electives and sufficient unrestricted electives to meet course requirements as specified by their degree program in addition to their core bioengineering curriculum.

Track 2: Biomechanics and Mechanobiology

TRACK MANAGERS: SINAN MUFTU AND JEFFREY RUBERTI

Biomechanics and mechanobiology are linked by the biological response to applied forces and strains. To understand the overall effect of load on biological systems, it is important to consider not only the deformation and shear rates that result from force application but also the short- and long-term biological responses. The biomechanics and mechanobiology track reflects this understanding and leverages the strong faculty research at Northeastern, which is attempting to tie biomechanics to biological responses at multiple scales.

The biomechanics track is designed to capitalize on the substantial expertise in the mechanical and industrial engineering department, which has a strong fundamental research program in biomechanics. Faculty in the department perform investigations that comprise theoretical, computational, and experimental investigations. Students who select this track must take all of the restricted electives in addition to the bioengineering core curriculum and sufficient unrestricted electives to meet course requirements as specified by their degree program.

Track 3: BioMEMs/BioNANO

TRACK MANAGERS: EDGAR GOLUCH AND SHASHI MURTHY

The bioMEMs/bioNANO track reflects Northeastern University's strength as indicated by the NSF Center for High Rate Nanomanufacturing, the NSF/NCI Nanomedicine IGERT training grant, and the strong pharmaceutical sciences department. In addition, Northeastern also has a research presence in MEMs that, when combined with the bioengineering curriculum, presents significant interdisciplinary opportunities for students in the program. Students may choose to complete this track by taking three of the restricted electives in addition to their core bioengineering curriculum and sufficient unrestricted electives to meet course requirements of their degree program.

Track 4: Biochemical and Bioenvironmental Engineering

TRACK MANAGERS: REBECCA CARRIER AND APRIL GU

The track reflects strengths in biochemical engineering and bioenvironmental engineering by active research programs focused in pharmaceutical bioprocessing, biomaterials, tissue engineering, drug delivery, environmental microbiology, biotreatment/bioremediation, and environmental modeling. Students wishing to pursue this track should take two of the restricted electives listed below in addition to the bioengineering core curriculum and sufficient unrestricted electives to meet the course requirements of their degree program.

Track 5: Motor Control

TRACK MANAGERS: RIFAT SIPAHI AND DAGMAR STERNAD

The motor control track is designed to capitalize on the collective expertise of cross-disciplinary collaborations between existing Northeastern faculty whose research lies at the intersection of sensorimotor control systems, neuroscience, and dynamical systems. Insights into learning and coordination of functional motor behavior provide the basis for a better understanding of neurological diseases of motor function such as stroke, Parkinson's disease, and cerebral palsy. Insights will be the foundation for designing better therapy and rehabilitation.

Students who select this track must take four out of five restricted electives in addition to the bioengineering core curriculum and unrestricted elective courses to meet requirements of the track program.

Track 6: Biocomputing

TRACK MANAGERS: STEFANO BASAGNI AND MIRIAM LEESER

The biocomputing track draws on strengths in computer engineering and computation applied to bioengineering applications. Bioengineering MS or PhD candidates may complete this track by taking both of the restricted electives and sufficient unrestricted electives to meet course requirements as specified by their degree program.

Track 7: Cell and Tissue Engineering

TRACK MANAGERS: ANAND ASTHAGIRI AND ERIN CRAM

Cell and tissue engineering is a major strength at Northeastern University with several research labs focused on understanding and engineering living cells and tissues. These labs are elucidating the quantitative principles that govern cell fate decisions and are developing design strategies to promote the assembly and patterning of multicellular systems into viable, functional tissues. Cells are remarkable physicochemical systems that sense, respond, and actively reshape their rich microenvironment. Parsing the dialogue between the microenvironment and cells and elucidating design strategies to engineer the dynamic cellular milieu has far-reaching implications for biomedicine, including applications such as tissue engineering and the development of novel therapeutic strategies.

This pioneering, multidisciplinary research is enabled by strengths at Northeastern in key foundational areas, such as biomolecular engineering, computational modeling, developmental biology, imaging, materials science, micro- and nanofluidics, mechanobiology, molecular cell biology, and systems biology.

Cell and tissue engineering is widely recognized as a core subfield of bioengineering. A formal track in this area offers our students a program of study that capitalizes on a major strength at Northeastern.

Track 8: General Bioengineering Studies

TRACK MANAGER: JEFFREY RUBERTI

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review
Qualifying examination (within three years of entry)
Dissertation committee
Area examination (dissertation prospectus/proposal)
Dissertation defense

General Requirements

Seminar		
BIOE 7390	Seminar (Register and complete four semesters)	0
Required Courses		
BIOE 5100	Medical Physiology	4
BIOE 7000	Principles of Bioengineering	4
Additional Course Work		
Complete 12 semester hours from the following:		12
BIOE 5651		
BIOE 7001	Biomaterials	
CHME 5630	Biochemical Engineering	
EECE 5664	Biomedical Signal Processing	
ME 5667	Solid Mechanics of Cells and Tissues	
Dissertation Courses		
Complete the following (repeatable) course twice:		
BIOE 9990	Dissertation	

Track Options

Complete one of the following tracks:

- Biomedical Imaging and Signal Processing Track (p.)
- Biomechanics and Mechanobiology Track (p. 116)
- BioMEMs/BioNANO Track (p. 116)
- Biochemical and Bioenvironmental Engineering Track (p. 117)
- Motor Control Track (p.)
- Biocomputing Track (p. 117)
- Cell and Tissue Engineering Track (p.)
- General Bioengineering Studies Track (p.)

BIOMEDICAL IMAGING AND SIGNAL PROCESSING TRACK

Required Courses		
EECE 7200	Linear Systems Analysis	4
EECE 7203	Complex Variable Theory and Differential Equations	4
EECE 7204	Applied Probability and Stochastic Processes	4
Complete 16 semester hours from the following:		16
BIOE 5235	Biomedical Imaging	

BIOE 5320	Advanced Biomedical Measurements and Instrumentation
BIOE 7100	Special Topics in Biomedical Imaging and Signal Processing
BIOL 5581	Biological Imaging
BIOL 5587	Comparative Neurobiology
CHEM 5612	Principles of Mass Spectrometry
CHEM 5613	Optical Methods of Analysis
CHEM 5637	Foundations of Spectroscopy
EECE 5648	Biomedical Optics
EECE 7202	Electromagnetic Theory 1
EECE 7271	Computational Methods in Electromagnetics
EECE 7280	Fourier and Binary Optics
EECE 7281	Fourier Optics
EECE 7284	Optical Properties of Matter
EECE 7293	Modern Imaging
EECE 7310	Modern Signal Processing
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7312	Statistical and Adaptive Signal Processing
EECE 7313	Pattern Recognition
EECE 7314	Auditory Signal Processing
EECE 7323	Numerical Optimization Methods
EECE 7337	Information Theory
PHYS 7741	Biological Physics 2
PSYC 5120	Proseminar in Sensation
PSYC 5130	Proseminar in Perception
PSYC 7220	Seminar in Sensation
PSYC 7230	Seminar in Perception
PSYC 7300	Advanced Quantitative Analysis
PT 5138 and PT 5139	Neuroscience and Lab for PT 5138
SLPA 5111	Anatomy and Physiology of the Auditory System
SLPA 6209	Psychoacoustics
SLPA 6301	Speech Science

BIOMECHANICS AND MECHANOBIOLOGY TRACK

Required Courses

BIOE 5650	Multiscale Biomechanics	4
CHME 5699	Special Topics in Chemical Engineering	4
ME 5665	Musculoskeletal Biomechanics	4

Mathematical Methods

Complete 4 semester hours from the following:		4
CHME 7320	Chemical Engineering Mathematics	
EECE 7200	Linear Systems Analysis	
EECE 7203	Complex Variable Theory and Differential Equations	
ME 7205	Advanced Mathematical Methods for Mechanical Engineers	

Electives

Complete 12 semester hours from the following:		12
BIOE 5380	Advanced Biomolecular Dynamics and Control	
BIOE 5410	Molecular Bioengineering	
BIOE 5630	Physiological Fluid Mechanics	
BIOE 5651		
BIOE 7300	Special Topics in Biomechanics	
BIOL 5601	Multidisciplinary Approaches in Motor Control	
EECE 7367	Robotics and Automation Systems	
ME 5650	Advanced Mechanics of Materials	
ME 5655	Dynamics and Mechanical Vibration	
ME 5657	Finite Element Method	
ME 5659	Control Systems Engineering	
ME 5667	Solid Mechanics of Cells and Tissues	
ME 7210	Elasticity and Plasticity	
ME 7238	Advanced Finite Element Method	
ME 7240	Composite Materials	
ME 7245	Fracture Mechanics and Failure Analysis	
ME 7255	Continuum Mechanics	
ME 7275	Essentials of Fluid Dynamics	
ME 7280	Statistical Thermodynamics	
ME 7325	Two Phase Flow	
PT 5133 and PT 5134	Kinesiology and Lab for PT 5133	
PT 5170 and PT 5171	Motor Control and Lab for PT 5170	
PT 6215 and PT 6216	Assistive Technology and Lab for PT 6215	

BIOMEMS/BIONANO TRACK

Required Course Work

EECE 5606	Micro- and Nanofabrication	4
ME 6260	Introduction to Microelectromechanical Systems (MEMS)	4
PHYS 5260	Introduction to Nanoscience and Nanotechnology	4

Mathematical Methods

Complete 4 semester hours from the following:		4
CHME 7320	Chemical Engineering Mathematics	
EECE 7200	Linear Systems Analysis	
EECE 7203	Complex Variable Theory and Differential Equations	
ME 7205	Advanced Mathematical Methods for Mechanical Engineers	

Electives

Complete 12 semester hours from the following:		12
CHEM 5613	Optical Methods of Analysis	
CHEM 5638	Molecular Modeling	
CHEM 7247	Advances in Nanomaterials	
CHME 5699	Special Topics in Chemical Engineering	
EECE 5606	Micro- and Nanofabrication	
ME 7262	Nanomanufacturing 1	
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market	
PHSC 5100	Concepts in Pharmaceutical Science	

PHSC 6210	Drug Design, Evaluation, and Development
PHYS 7731	Biological Physics 1
PMST 6250	Advanced Physical Pharmacy
PMST 6252	Pharmacokinetics and Drug Metabolism
PMST 6254	Advanced Drug Delivery System
PMST 6256	Advanced Pharmacokinetics

BIOCHEMICAL AND BIOENVIRONMENTAL TRACK

Required Course Work

Complete 8 semester hours from the following:		8
BIOL 6300	Biochemistry	
CHME 5630	Biochemical Engineering	
CHME 7340	Chemical Engineering Kinetics	
CHME 7350	Transport Phenomena	
CIVE 7251	Environmental Biological Processes	
Mathematical Methods		
Complete 4 semester hours from the following:		4
CHME 7320	Chemical Engineering Mathematics	
EECE 7200	Linear Systems Analysis	
EECE 7203	Complex Variable Theory and Differential Equations	
ME 7205	Advanced Mathematical Methods for Mechanical Engineers	
Electives		
Complete 16 semester hours from the following:		16
BIOL 5581	Biological Imaging	
BIOL 6301	Molecular Cell Biology	
CHEM 5612	Principles of Mass Spectrometry	
CHEM 5613	Optical Methods of Analysis	
CHEM 5620	Protein Chemistry	
CHEM 5621	Principles of Chemical Biology for Chemists	
CHEM 5660	Analytical Biochemistry	
CHEM 5686	Fundamentals of Molecular Structure and Electronics	
CHEM 7317	Analytical Biotechnology	
PHSC 5100	Concepts in Pharmaceutical Science	
PHSC 6218	Biomedical Chemical Analysis	
PHSC 6290	Biophysical Methods in Drug Discovery	
PHYS 7731	Biological Physics 1	
PMST 6252	Pharmacokinetics and Drug Metabolism	
PMST 6254	Advanced Drug Delivery System	
PMST 6256	Advanced Pharmacokinetics	

MOTOR CONTROL TRACK

Required Course Work

BIOL 5601	Multidisciplinary Approaches in Motor Control	4
ME 5659	Control Systems Engineering	4
ME 5665	Musculoskeletal Biomechanics	4
Mathematical Methods		
Complete 4 semester hours from the following:		4
CHME 7320	Chemical Engineering Mathematics	
EECE 7200	Linear Systems Analysis	
EECE 7203	Complex Variable Theory and Differential Equations	
ME 7205	Advanced Mathematical Methods for Mechanical Engineers	
Electives		
Complete 12 semester hours from the following:		12
BIOL 5587	Comparative Neurobiology	
CS 5335 and CS 5336	Robotic Science and Systems and Lab for CS 5335	
EECE 7200	Linear Systems Analysis	
EECE 7204	Applied Probability and Stochastic Processes	
EECE 7213	System Identification and Adaptive Control	
EECE 7214	Optimal and Robust Control	
EECE 7310	Modern Signal Processing	
IE 7280	Statistical Methods in Engineering	
IE 7315	Human Factors Engineering	
ME 5655	Dynamics and Mechanical Vibration	
ME 6200	Mathematical Methods for Mechanical Engineers 1	
ME 6201	Mathematical Methods for Mechanical Engineers 2	
ME 7350	Graduate Seminar in Robotics	
PHYS 7301	Classical Mechanics/Math Methods	
PHYS 7321	Computational Physics	
PHYS 7735	Nonlinear Dynamics	
PHYS 7741	Biological Physics 2	
PSYC 5180	Quantitative Methods 1	
PSYC 5181	Quantitative Methods 2	
PT 5138 and PT 5139	Neuroscience and Lab for PT 5138	
PT 5150 and PT 5151	Motor Control, Development, and Learning and Lab for PT 5150	

BIOCOMPUTING TRACK

Required Course Work

EECE 7205	Fundamentals of Computer Engineering	4
EECE 7360	Combinatorial Optimization	4
Mathematical Methods		
Complete 4 semester hours from the following:		4
CHME 7320	Chemical Engineering Mathematics	
EECE 7200	Linear Systems Analysis	
EECE 7203	Complex Variable Theory and Differential Equations	
ME 7205	Advanced Mathematical Methods for Mechanical Engineers	
Electives		
Complete 16 semester hours from the following:		16
BIOL 5581	Biological Imaging	
BIOL 5587	Comparative Neurobiology	
CS 5100	Foundations of Artificial Intelligence	
CS 5200	Database Management Systems	
CS 5310	Computer Graphics	

CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5400	Principles of Programming Language
CS 5600	Computer Systems
CS 5800	Algorithms
CS 6110	Knowledge-Based Systems
CS 6140	Machine Learning
CS 6200	Information Retrieval
CS 6410	Compilers
CS 6610	Parallel Computing
CS 6810	Distributed Algorithms
EECE 7200	Linear Systems Analysis
EECE 7203	Complex Variable Theory and Differential Equations
EECE 7204	Applied Probability and Stochastic Processes
EECE 7313	Pattern Recognition
EECE 7339	Testing and Design for Testability
EECE 7350	Software Engineering 1
EECE 7351	Software Engineering 2
EECE 7352	Computer Architecture
EECE 7353	VLSI Design
EECE 7354	VLSI Architecture
EECE 7357	Fault-Tolerant Computers
EECE 7358	Parallel Architecture for High-Performance Computing
EECE 7359	Multiprocessor Architectures
EECE 7361	Digital Hardware Synthesis
EECE 7364	Mobile and Wireless Networking
EECE 7365	Distributed Systems
EECE 7367	Robotics and Automation Systems
EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7389	Robot Vision and Sensors
OR 6205	Deterministic Operations Research
OR 7230	Probabilistic Operation Research

CELL AND TISSUE TRACK

Required Courses

BIOE 5420	Cellular Engineering	4
BIOE 5430	Principles and Applications of Tissue Engineering	4
BIOL 6401	Research Methods and Critical Analysis in Molecular Cell Biology	4

Mathematical Methods

Complete 4 semester hours from the following:		4
CHME 7320	Chemical Engineering Mathematics	
EECE 7200	Linear Systems Analysis	
EECE 7203	Complex Variable Theory and Differential Equations	
ME 7205	Advanced Mathematical Methods for Mechanical Engineers	

Electives

Complete 12 semester hours from the following:		12
BIOE 5380	Advanced Biomolecular Dynamics and Control	
BIOE 5410	Molecular Bioengineering	
BIOE 5630	Physiological Fluid Mechanics	
BIOE 7200	Special Topics in Cell and Tissue Engineering	
BIOL 5307	Biological Electron Microscopy	
BIOL 5543	Stem Cells and Regeneration	
BIOL 5581	Biological Imaging	
CHME 5699	Special Topics in Chemical Engineering	
CHME 7340	Chemical Engineering Kinetics	
CHME 7350	Transport Phenomena	
EECE 5648	Biomedical Optics	
ME 5667	Solid Mechanics of Cells and Tissues	
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market	
PHYS 7741	Biological Physics 2	

GENERAL BIOENGINEERING STUDIES TRACK

Mathematical Methods

Complete one of the following:		4
CHME 7320	Chemical Engineering Mathematics	
EECE 7200	Linear Systems Analysis	
EECE 7203	Complex Variable Theory and Differential Equations	

Electives

Complete 24 semester hours from the following:		24
BIOE 5250	Design, Manufacture, and Evaluation of Medical Devices	
BIOE 5380	Advanced Biomolecular Dynamics and Control	
BIOE 5420	Cellular Engineering	
BIOE 5430	Principles and Applications of Tissue Engineering	
BIOE 5630	Physiological Fluid Mechanics	
BIOE 5650	Multiscale Biomechanics	
BIOE 5651		
BIOE 7100	Special Topics in Biomedical Imaging and Signal Processing	
BIOE 7300	Special Topics in Biomechanics	
BIOL 5307	Biological Electron Microscopy	
BIOL 5543	Stem Cells and Regeneration	
BIOL 5553	Biology of Muscle: Molecules to Movements	
BIOL 5581	Biological Imaging	
BIOL 5587	Comparative Neurobiology	
BIOL 5601	Multidisciplinary Approaches in Motor Control	
BIOL 6300	Biochemistry	
BIOL 6301	Molecular Cell Biology	
BIOL 6401	Research Methods and Critical Analysis in Molecular Cell Biology	
BINF 6200	Bioinformatics Programming	
BINF 6308	Bioinformatics Computational Methods 1	

BINF 6309	Bioinformatics Computational Methods 2
CAEP 6202	Research, Evaluation, and Data Analysis
CHEM 5612	Principles of Mass Spectrometry
CHEM 5613	Optical Methods of Analysis
CHEM 5620	Protein Chemistry
CHEM 5621	Principles of Chemical Biology for Chemists
CHEM 5637	Foundations of Spectroscopy
CHEM 5638	Molecular Modeling
CHEM 5660	Analytical Biochemistry
CHEM 5686	Fundamentals of Molecular Structure and Electronics
CHEM 7247	Advances in Nanomaterials
CHEM 7317	Analytical Biotechnology
CHME 5630	Biochemical Engineering
CHME 5699	Special Topics in Chemical Engineering
CHME 7260	Special Topics in Chemical Engineering
CHME 7330	Chemical Engineering Thermodynamics
CHME 7340	Chemical Engineering Kinetics
CHME 7350	Transport Phenomena
CIVE 7251	Environmental Biological Processes
CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5310	Computer Graphics
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5335	Robotic Science and Systems
CS 5336	Lab for CS 5335
CS 5600	Computer Systems
CS 5800	Algorithms
CS 6110	Knowledge-Based Systems
CS 6140	Machine Learning
CS 6200	Information Retrieval
CS 6410	Compilers
CS 6610	Parallel Computing
CS 6810	Distributed Algorithms
EECE 5606	Micro- and Nanofabrication
EECE 5648	Biomedical Optics
EECE 7200	Linear Systems Analysis
EECE 7202	Electromagnetic Theory 1
EECE 7203	Complex Variable Theory and Differential Equations
EECE 7204	Applied Probability and Stochastic Processes
EECE 7205	Fundamentals of Computer Engineering
EECE 7211	Nonlinear Control
EECE 7213	System Identification and Adaptive Control
EECE 7214	Optimal and Robust Control
EECE 7236	Special Topics in Control
EECE 7271	Computational Methods in Electromagnetics
EECE 7280	Fourier and Binary Optics
EECE 7281	Fourier Optics
EECE 7284	Optical Properties of Matter
EECE 7293	Modern Imaging
EECE 7310	Modern Signal Processing
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7312	Statistical and Adaptive Signal Processing
EECE 7313	Pattern Recognition
EECE 7314	Auditory Signal Processing
EECE 7323	Numerical Optimization Methods
EECE 7335	Detection and Estimation Theory
EECE 7337	Information Theory
EECE 7339	Testing and Design for Testability
EECE 7350	Software Engineering 1
EECE 7351	Software Engineering 2
EECE 7352	Computer Architecture
EECE 7353	VLSI Design
EECE 7354	VLSI Architecture
EECE 7357	Fault-Tolerant Computers
EECE 7358	Parallel Architecture for High-Performance Computing
EECE 7359	Multiprocessor Architectures
EECE 7360	Combinatorial Optimization
EECE 7361	Digital Hardware Synthesis
EECE 7364	Mobile and Wireless Networking
EECE 7365	Distributed Systems
EECE 7367	Robotics and Automation Systems
EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7389	Robot Vision and Sensors
EXSC 6263	Research Design and Methodology
IE 7280	Statistical Methods in Engineering
IE 7315	Human Factors Engineering
ME 5650	Advanced Mechanics of Materials
ME 5655	Dynamics and Mechanical Vibration
ME 5657	Finite Element Method
ME 5659	Control Systems Engineering
ME 5665	Musculoskeletal Biomechanics
ME 5667	Solid Mechanics of Cells and Tissues
ME 6200	Mathematical Methods for Mechanical Engineers 1
ME 6201	Mathematical Methods for Mechanical Engineers 2
ME 6260	Introduction to Microelectromechanical Systems (MEMS)
ME 7210	Elasticity and Plasticity
ME 7238	Advanced Finite Element Method
ME 7240	Composite Materials
ME 7245	Fracture Mechanics and Failure Analysis
ME 7255	Continuum Mechanics
ME 7262	Nanomanufacturing 1
ME 7275	Essentials of Fluid Dynamics

ME 7280	Statistical Thermodynamics
ME 7325	Two Phase Flow
OR 6205	Deterministic Operations Research
OR 7230	Probabilistic Operation Research
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market
PHSC 5100	Concepts in Pharmaceutical Science
PHSC 6210	Drug Design, Evaluation, and Development
PHSC 6218	Biomedical Chemical Analysis
PHSC 6290	Biophysical Methods in Drug Discovery
PHYS 5260	Introduction to Nanoscience and Nanotechnology
PHYS 7301	Classical Mechanics/Math Methods
PHYS 7321	Computational Physics
PHYS 7731	Biological Physics 1
PHYS 7735	Nonlinear Dynamics
PHYS 7741	Biological Physics 2
PMST 6250	Advanced Physical Pharmacy
PMST 6252	Pharmacokinetics and Drug Metabolism
PMST 6254	Advanced Drug Delivery System
PMST 6256	Advanced Pharmacokinetics
PSYC 5120	Proseminar in Sensation
PSYC 5130	Proseminar in Perception
PSYC 5180	Quantitative Methods 1
PSYC 5181	Quantitative Methods 2
PSYC 7220	Seminar in Sensation
PSYC 7230	Seminar in Perception
PSYC 7300	Advanced Quantitative Analysis
PT 5133	Kinesiology
PT 5134	Lab for PT 5133
PT 5138	Neuroscience
PT 5139	Lab for PT 5138
PT 5150	Motor Control, Development, and Learning
PT 5151	Lab for PT 5150
PT 5170	Motor Control
PT 5171	Lab for PT 5170
PT 6215	Assistive Technology
SLPA 5111	Anatomy and Physiology of the Auditory System
SLPA 6209	Psychoacoustics
SLPA 6301	Speech Science

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.000 GPA required

Bioengineering, PhD—Advanced Entry

Our interdisciplinary Doctor of Philosophy program in bioengineering draws on faculty across the university and reflects the significant strengths of bioengineering research in multiple areas. Students accepted to the bioengineering program will undertake a rigorous core curriculum in basic bioengineering science followed by an immersion track curriculum. There are currently eight tracks from which to choose:

- Track 1: Biomedical Imaging and Signal Processing
- Track 2: Biomechanics and Mechanobiology
- Track 3: BioMEMs/BioNANO
- Track 4: Biochemical and Bioenvironmental Engineering
- Track 5: Motor Control
- Track 6: Biocomputing
- Track 7: Cell and Tissue Engineering
- Track 8: General Bioengineering Studies

Biology can inspire engineering. Increasingly, discoveries in the life sciences reveal processes, complexity, and control without analogy in the limited world of traditional engineering. Current methods of producing nanoscale control over molecules cannot reproduce the organization found in even the simplest organisms. Energy capture, robust control, remediation, and self-assembly are all employed with efficiency unparalleled by anything in today's laboratories. At the same time, traditional engineering disciplines struggle to find new and complex challenges. The last fifty years of basic life science research have gradually peeled the layers of complexity from biological processes, unmasking the fundamental underpinnings on which biological systems are constructed. Bioinspired engineering has the potential to transform the technological landscape of the twenty-first century. Astonishingly, it represents merely one of the myriad opportunities presented at the interface of biology and engineering.

The field of bioengineering is broad and includes all research at the interface of engineering and biology—this includes bioprocesses, environmental microbiology, biomaterials and tissue engineering, bioelectricity, biomechanics, biomedical and biological imaging, nanotechnology in medicine and the environment, and engineering design for human interfacing. At Northeastern, bioengineering PhD students have an opportunity to be trained to appreciate advances in bioengineering across a wide range of disciplines while they perform highly focused and cutting-edge bioengineering research with one of our many core or affiliated faculty members.

Degree Requirements

Completion of the PhD degree requires students to successfully complete the following requirements:

- **Curriculum:** The curriculum comprises a strong fundamental, broad core of courses that is then coupled with one of a series of available tracks for depth in a particular field of study.
- **Qualifying examination (written and oral):** To qualify to continue in the PhD program, students must pass the bioengineering comprehensive qualifying examination, which comprises the synthesis of knowledge derived from the core curriculum and current literature presented in the form of an R21 NIH-style proposal. Oral defense of the proposal is required to pass the exam as well as satisfactory research progress and satisfactory academic standing. Details of the formal qualification exam procedure and timing are available in the bioengineering office and may be requested electronically at any time from the graduate director. Advanced Entry PhD students must successfully complete the qualifying examination (written and oral) within two years of entry.
- **Qualifying examination committee:** The qualifying examination committee is composed of a minimum of three members, two of whom must be selected from the list of bioengineering-affiliated faculty. In addition, one of the two affiliated faculty must have a

primary appointment in the College of Engineering. The student's primary advisor may not sit on the qualifying examination committee.

- **Dissertation committee:** The dissertation committee is composed of a minimum of three members, two of whom must be selected from the list of bioengineering-affiliated faculty. In addition, one of the two affiliated faculty must have a primary appointment in the College of Engineering.
- **Area exam (dissertation prospectus/proposal):** PhD students must submit a "prospectus" to their dissertation committee in the form of an R21 NIH-style research plan and successfully defend the research plan in the form of an open presentation to their dissertation committee. The area exam should be completed as soon as is practical after successful completion of course work and qualifying exams.
- **Dissertation:** PhD candidates must satisfactorily complete and defend a dissertation describing original research in bioengineering in an open presentation to their dissertation committee.
- **Dissertation Course Requirements:** After achieving PhD candidacy, the doctoral candidate, in consultation with his or her research advisor, must register in two consecutive semesters (may include full summer term) forDissertation (BIOE 9990). Upon completion of this sequence, the student must then register for Dissertation Continuation (BIOE 9996) in every semester (in each fall and spring term and also in the summer term if summer is the student's last semester) until the dissertation is completed. Students may not register for Dissertation Continuation (BIOE 9996) until they fulfill the two-semester sequence of Dissertation (BIOE 9990) .

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Exam Preparation—Doctoral (BIOE 8960) , can be taken if needed to fulfill the full-time course registration requirement. Exam Preparation—Doctoral (BIOE 8960) is an individual instruction course, billed at 1 semester hour, and graded S or U. Exam Preparation—Doctoral (BIOE 8960) does not have any course content, and students must register in a section for which their research advisor is listed as the "instructor."

The curriculum for PhD students with advanced standing will be selected from the available core and elective courses under the guidance of the program director and the student's primary advisor. The advanced standing PhD degree requires a minimum of **16** semester hours of course work to be approved by the graduate director and a completed PhD dissertation. Advanced standing constitutes receipt of a relevant and accepted master's degree at a qualified institution.

The core emphasizes the breadth of topics that our graduates must appreciate as internationally competitive bioengineers. It utilizes existing courses within the College of Engineering as well as introducing new/external courses that are necessary and will be developed.

Track electives may be replaced with up to 12 semester hours of relevant independent studies Independent Study (BIOE 7978).

Requirements	Credits
Advisor-approved course work	16 SH (minimum)
Advanced seminar (register and complete four semesters)	0 SH
Dissertation	0 SH
Minimum semester hours required	**16 SH**

TRACK 1: BIOMEDICAL IMAGING AND SIGNAL PROCESSING

Track Managers: Dana Brooks and Deniz Erdogmus

The biomedical imaging and signal processing track reflects Northeastern University's outstanding research profile in various aspects of biological and biomedical imaging and image processing and signal processing. This is evidenced by the Gordon Center for Subsurface Sensing and Imaging Systems, the Center for Communications and Digital Signal Processing Research, and the strong externally funded active research groups and faculty whose interests lie at the intersection of imaging, signal processing technologies, and biological and medical applications.

The courses in this track concentrate largely on general mathematical methods for signal and image processing and image formation and on image acquisition modalities and applications. Research in this area takes place at the intersection of these technical streams, and students completing the track will have a sufficiently strong background in the component areas to be able to carry out high-quality research efforts.

TRACK 2: BIOMECHANICS AND MECHANOBIOLOGY

Track Managers: Sinan Muftu and Jeffrey Ruberti

Biomechanics and mechanobiology are linked by the biological response to applied forces and strains. To understand the overall effect of load on biological systems, it is important to consider not only the deformation and shear rates that result from force application but also the short- and long-term biological responses. The biomechanics and mechanobiology track reflects this understanding and leverages the strong faculty research at Northeastern, which is attempting to tie biomechanics to biological responses at multiple scales.

The biomechanics track is designed to capitalize on the substantial expertise in the mechanical and industrial engineering department, which has a strong fundamental research program in biomechanics. Faculty in the department perform investigations that comprise theoretical, computational, and experimental investigations.

TRACK 3: BIOMEMS/BIONANO

Track Managers: Edgar Goluch and Shashi Murthy

The bioMEMs/bioNANO track reflects Northeastern University's strength as indicated by the NSF Center for High Rate Nanomanufacturing, the NSF/NCI Nanomedicine IGERT training grant, and the strong pharmaceutical sciences department. In addition, Northeastern also has a research presence in MEMs that, when combined with the bioengineering curriculum, presents significant interdisciplinary opportunities for students in the program.

TRACK 4: BIOCHEMICAL AND BIOENVIRONMENTAL

Track Managers: Rebecca Carrier and April Gu

The track reflects strengths in biochemical engineering and bioenvironmental engineering by active research programs focused in pharmaceutical bioprocessing, biomaterials, tissue engineering, drug delivery, environmental microbiology, biotreatment/bioremediation, and environmental modeling.

TRACK 5: MOTOR CONTROL

Track Managers: Rifat Sipahi and Dagmar Sternad

The motor control track is designed to capitalize on the collective expertise of cross-disciplinary collaborations between existing Northeastern faculty whose research lies at the intersection of sensorimotor control systems, neuroscience, and dynamical systems. Insights into learning and coordination of functional motor behavior provide the basis for a better understanding of neurological diseases of motor function such as stroke, Parkinson's disease, and cerebral

palsy. Insights will be the foundation for designing better therapy and rehabilitation.

TRACK 6: BIOCOMPUTING

Track Managers: Stefano Basagni and Miriam Leeser

The biocomputing track draws on strengths in computer engineering and computation applied to bioengineering applications.

TRACK 7: CELL AND TISSUE ENGINEERING

Track Managers: Anand Asthagiri and Erin Cram

Cell and tissue engineering is a major strength at Northeastern University with several research labs focused on understanding and engineering living cells and tissues. These labs are elucidating the quantitative principles that govern cell fate decisions and are developing design strategies to promote the assembly and patterning of multicellular systems into viable, functional tissues. Cells are remarkable physicochemical systems that sense, respond, and actively reshape their rich microenvironment. Parsing the dialogue between the microenvironment and cells and elucidating design strategies to engineer the dynamic cellular milieu has far-reaching implications for biomedicine, including applications such as tissue engineering and the development of novel therapeutic strategies.

This pioneering, multidisciplinary research is enabled by strengths at Northeastern in key foundational areas, such as biomolecular engineering, computational modeling, developmental biology, imaging, materials science, micro- and nanofluidics, mechanobiology, molecular cell biology, and systems biology.

Cell and tissue engineering is widely recognized as a core subfield of bioengineering. A formal track in this area offers our students a program of study that capitalizes on a major strength at Northeastern.

TRACK 8: GENERAL BIOENGINEERING STUDIES

Track Manager: Jeffrey Ruberti

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review
Qualifying examination (within two years of entry)
Dissertation committee
Area examination (dissertation prospectus/proposal)
Dissertation defense

General Requirements

Seminar		
BIOE 7390	Seminar (Register and complete four semesters)	0
Approved Course Work		
Select courses in consultation with faculty advisor.		16
Dissertation		
Complete the following (repeatable) course twice:		
BIOE 9990	Dissertation	

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Bioengineering, MSBioE

Students accepted to the Master of Science in Bioengineering program have the option to carry out research or complete a course-only program of studies:

- Thesis option resulting in the preparation and defense of an MS thesis (Thesis (BIOE 7990), 8 semester hours of research.

Students who select to complete an MS thesis as part of their degree must form a thesis committee comprised of at least three members. The thesis committee must include the thesis advisor, and at least two members must be tenured or tenure-track faculty (either BioE or BioE-affiliated faculty). One committee member must be both a tenured or tenure-track faculty in BioE or a BioE-affiliated faculty *and* a faculty in the College of Engineering. The student shall present the thesis to this committee and to the BioE faculty at large in the form of a seminar before final approval of the thesis by the committee.

- MS project option (Master's Project (BIOE 7890), 4 semester hours of research)
- Course-only option

Students are required to complete a total of 33 semester hours of courses with a minimum cumulative grade-point average (GPA) of 3.000 to graduate with an MS in bioengineering. All MS students are required to take two core courses (Medical Physiology (BIOE 5100), and Principles of Bioengineering (BIOE 6000)). Each student must select a concentration and complete two required courses specific to that concentration. In addition, each student needs to complete 12 semester hours of technical electives if they are completing the thesis option, 16 semester hours for the project option, or 20 semester hours for the course-only option. Courses are selected from an approved list of technical electives for their concentration. Enrollment in Seminar (BIOE 7390) is required each term.

Students have four concentrations from which to choose:

- Concentration 1: Bioimaging and Signal Processing
- Concentration 2: Cell and Tissue Engineering
- Concentration 3: Biomechanics
- Concentration 4: Biomedical Devices

Concentrations

A concentration is required. Each concentration has two required courses and a list of technical electives from which the student should select three to five courses, depending on whether he or she selects the thesis option, project option, or course-only option.

CONCENTRATION IN BIOIMAGING AND SIGNAL PROCESSING

This concentration is appropriate for students interested in biomedical imaging and processing of a wide array of signals from biological systems and biomedical instruments. Two courses (Linear Systems Analysis (EECE 7200), and Applied Probability and Stochastic Processes (EECE 7204)) are required of all students choosing this option. Extensive additional options are available as approved technical electives.

CONCENTRATION IN CELL AND TISSUE ENGINEERING

The cell and tissue engineering concentration is appropriate for students interested in molecular, cell, and tissue engineering. Two courses (Molecular Bioengineering (BIOE 5410), and (BIOE 5420)) are required of all cell and tissue engineering students. There is an extensive list of approved technical electives to choose from to complete the degree.

CONCENTRATION IN BIOMECHANICS

Students who join the biomechanics concentration will cover multiscale mechanics, including whole-body movement, mechanical properties of biomaterials, and fluid mechanics of physiological fluids. The two courses required of all biomechanics concentration students are Multiscale Biomechanics (BIOE 5650) and Musculoskeletal Biomechanics (ME 5665).

CONCENTRATION IN BIOMEDICAL DEVICES

The biomedical devices concentration is appropriate for students interested in the design and implementation of biological devices and implants. Two core courses, Design of Biomedical Instrumentation (BIOE 5810), andDesign, Manufacture, and Evaluation of Medical Devices (BIOE 5250), are required for all students in this concentration.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Bioengineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Bioengineering in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour-curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 33-semester-hour degree and certificate will require 17 hours of advisor-approved bioengineering technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Note: This major requires a concentration: biomechanics, biomedical devices, bioimaging and signal processing, or cell and tissue engineering. Consult your college administrator.

General Requirements

Seminar		
BIOE 7390	Seminar	0
Required Core		
A grade of C or higher is required in each course:		
BIOE 5100	Medical Physiology	4
BIOE 6000	Principles of Bioengineering	1

Concentrations

Complete one of the following four concentrations:

- Bioimaging and Signal Processing (p. 123)
- Cell and Tissue Engineering (p. 123)
- Biomechanics (p. 124)
- Biomedical Devices (p. 124)

BIOIMAGING AND SIGNAL PROCESSING

Required Course Work		
A grade of C or higher is required.		
EECE 7200	Linear Systems Analysis	4
EECE 7204	Applied Probability and Stochastic Processes	4
Course Work Option		
Complete 20 semester hours from the course list.		20
Project Option		
BIOE 7890	Master's Project	4
Electives		
Complete 16 semester hours from the course list.		16
Thesis Option		
Complete the following (repeatable) course twice:		8
BIOE 7990	Thesis	
Electives		
Complete 12 semester hours from the course list.		12
Course List		
BIOE 5320	Advanced Biomedical Measurements and Instrumentation	
BIOE 5235	Biomedical Imaging	
BIOE 7100	Special Topics in Biomedical Imaging and Signal Processing	
BIOL 5581	Biological Imaging	
EECE 5639	Computer Vision	
EECE 5648	Biomedical Optics	
EECE 7203	Complex Variable Theory and Differential Equations	
EECE 7204	Applied Probability and Stochastic Processes	
EECE 7314	Auditory Signal Processing	
PHSC 6226	Imaging in Medicine and Drug Discovery	

CELL AND TISSUE ENGINEERING

Required Course Work		
A grade of C or higher is required.		
BIOE 5410	Molecular Bioengineering	4
BIOE 5420	Cellular Engineering	4
Course Work Option		
Complete 20 semester hours from the course list.		20
Project Option		
BIOE 7890	Master's Project	4
Electives		
Complete 16 semester hours from the course list.		16
Thesis Option		
Complete the following (repeatable) course twice:		8
BIOE 7990	Thesis	
Electives		
Complete 12 semester hours from the course list.		12
Course List		
BIOE 5430	Principles and Applications of Tissue Engineering	
BIOE 5820	Biomaterials	
BIOL 5543	Stem Cells and Regeneration	
BIOL 6301	Molecular Cell Biology	
CHEM 5500	Introduction to Regulatory Science	
ME 5667	Solid Mechanics of Cells and Tissues	

NNMD 5370	Nanomedicine Research Techniques	
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market	

BIOMECHANICS

Required Course Work

A grade of C or higher is required.		
ME 5665	Musculoskeletal Biomechanics	4
BIOE 5650	Multiscale Biomechanics	4
Course Work Option		
Complete 20 semester hours from the course list.		20
Project Option		
BIOE 7890	Master's Project	4
Electives		
Complete 16 semester hours from the course list.		16
Thesis Option		
Complete the following (repeatable) course twice:		8
BIOE 7990	Thesis	
Electives		
Complete 12 semester hours from the course list.		12
Course List		
BIOE 5630	Physiological Fluid Mechanics	
BIOE 5651		
BIOE 7001	Biomaterials	
BIOE 7300	Special Topics in Biomechanics	
BIOL 5553	Biology of Muscle: Molecules to Movements	
BIOL 5601	Multidisciplinary Approaches in Motor Control	
BIOL 7384	Topics in Integrative Biology	
EECE 7200	Linear Systems Analysis	
EECE 7203	Complex Variable Theory and Differential Equations	
EECE 7367	Robotics and Automation Systems	
ME 5650	Advanced Mechanics of Materials	
ME 5655	Dynamics and Mechanical Vibration	
ME 5657	Finite Element Method	
ME 5659	Control Systems Engineering	
ME 5667	Solid Mechanics of Cells and Tissues	
ME 7210	Elasticity and Plasticity	
ME 7238	Advanced Finite Element Method	
ME 7240	Composite Materials	
ME 7245	Fracture Mechanics and Failure Analysis	
ME 7255	Continuum Mechanics	

BIOMEDICAL DEVICES

Required Course Work

A grade of C or higher is required.		
BIOE 5810	Design of Biomedical Instrumentation	4
BIOE 5250	Design, Manufacture, and Evaluation of Medical Devices	4
Course Work Option		
Complete 20 semester hours from the course list.		20
Project Option		
BIOE 7890	Master's Project	4
Electives		
Complete 16 semester hours from the course list.		16
Thesis Option		
Complete the following (repeatable) course twice:		8
BIOE 7990	Thesis	
Electives		
Complete 12 semester hours from the course list.		12
Course List		
BIOL 5587	Comparative Neurobiology	
BIOE 5850	Design of Implants	
BIOE 7001	Biomaterials	
BIOE 7400	Special Topics in Biomedical Devices	
CHEM 5500	Introduction to Regulatory Science	
CHEM 7247	Advances in Nanomaterials	
EECE 5606	Micro- and Nanofabrication	
ME 5659	Control Systems Engineering	
ME 5665	Musculoskeletal Biomechanics	
ME 5667	Solid Mechanics of Cells and Tissues	
ME 7262	Nanomanufacturing 1	
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market	
NNMD 5370	Nanomedicine Research Techniques	
PHSC 6226	Imaging in Medicine and Drug Discovery	

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Chemical Engineering

Website (http://www.che.neu.edu)

Thomas J. Webster, PhD
Professor and Chair
Art Zafiropoulo Chair in Engineering
th.webster@northeastern.edu

Ming Su, PhD
Associate Professor and Associate Chair for Graduate Studies

313 Snell Engineering Center
617.373.2989
617.373.2209 (fax)

The department offers a Master of Science and a Doctor of Philosophy in Chemical Engineering. The MS degree is offered as either a thesis MS or a course work (nonthesis) MS degree. Most courses are in the late afternoon or early evening to make them accessible to part-time students with full-time industrial careers. A full-time MS student may apply for participation in the cooperative (co-op) education plan. MS students pursuing the thesis MS option should first gain the consent of their advisors prior to participating in the co-op plan. The course work MS may be taken part-time, but the thesis MS and PhD degrees are only offered as a full-time program. Any deviations from the curriculum must be addressed by petition to the graduate committee and will be considered on a case-by-case basis.

Candidates pursuing a thesis MS or a PhD can select thesis topics from a diverse range of faculty research interests. New graduate students can learn about ongoing research from individual faculty members, faculty websites, and graduate student seminars. Graduate student seminars are held on a regular basis and provide an interactive forum for learning and exchanging research ideas.

Graduate Certificate Options

Students enrolled in a master's degree in chemical engineering have the opportunity to also pursue one of the many engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering Leadership Program (p. 204) in combination with the MS degree.

Programs

Doctor of Philosophy (PhD)

- Chemical Engineering (p. 125)
- Chemical Engineering—Advanced Entry (p. 126)

Master of Science in Chemical Engineering (MSCHE)

- Chemical Engineering (p. 127)

Graduate Certificate

- Process Safety Engineering (p. 129)

Chemical Engineering, PhD

Each student admitted to the PhD program in chemical engineering will initially be designated a *doctoral student.* Upon successful completion of the requirements for doctoral candidacy as described below, a student is reclassified as a *doctoral candidate.* After establishing candidacy, a student must complete a program of academic course work and a dissertation under the direction of a dissertation advisor. All doctoral candidates must also pass a final oral examination.

Qualifying for Doctoral Candidacy

To qualify for doctoral candidacy, the student must demonstrate mastery of the four core courses of chemical engineering (thermodynamics, kinetics, transport, and mathematics). To become a doctoral candidate, students must maintain a grade-point average (GPA) of 3.500 or above in the four core courses and have no individual grade below a B in the four core courses.

In addition, each student must also demonstrate critical thinking, analysis, and experimental planning skills related to their dissertation research topic through a written candidacy proposal and an oral defense of this proposal. The student must pass, as determined by the student's dissertation committee, this oral candidacy proposal defense in order to advance to doctoral candidacy. The oral presentation will be open to students, faculty, and the student's dissertation committee. The student earns the classification of *doctoral candidate* upon successful completion of these requirements.

Course Requirements

A minimum of 24 semester hours (SH) of academic course work, **not including any independent study credits,** beyond the bachelor's degree is required. The 24 SH must include at least 16 SH of academic course work (exclusive of thesis or dissertation) taken at Northeastern University. All four of the core courses (see table under Program Requirements) must be included in the student's academic graduate course work.

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course,Candidacy Preparation—Doctoral (CHME 8960), can be taken if needed to fulfill full-time course registration. The course is an individual instruction course, billed at 1 SH, and graded S or U. There is no course content, and students must register in a section with their research or academic advisor as the "instructor."

After obtaining PhD candidacy, students are required to register forDissertation (CHME 9990) for two consecutive semesters. This is then followed by registration for Dissertation Continuation (CHME 9996) in each semester thereafter until the dissertation has been completed and defended. ***Note:*** **No course credits are awarded for Dissertation (CHME 9990) or Dissertation Continuation (CHME 9996) ; however, a student is considered full-time if registered for either of these courses.**

All students pursuing a doctoral degree must enroll in the department's seminar course for each semester they are working toward their degree.

Students will be advised on their courses for the first semester by the associate chair for graduate studies. After the first semester, students will work with their dissertation advisor to determine appropriate courses and course schedule to meet their educational needs and aspirations. Upon consultation with the dissertation advisor, a student may take up to 44 SH of course credit without additional financial penalty. Students and dissertation advisors should keep in mind that the university residency requirement requires two semesters of academic studies after becoming a doctoral candidate.

Language Requirement

There is no foreign language requirement for the PhD degree. However, each candidate must be proficient in technical writing and oral presentation in the English language. The graduate committee may require additional course work to improve language proficiency, if necessary.

Residence Requirement

A student satisfies the residence requirement by completing one academic year of full-time graduate studies during two consecutive academic semesters after qualifying for doctoral candidacy. Additional required course work (exclusive of seminars) may be completed during this period. Students are required to be continually enrolled while pursuing the completion of the dissertation.

Dissertation

After a student establishes doctoral candidacy, he or she must complete a dissertation that embodies the results of extended original research and includes material suitable for publication. The student is responsible for proposing a dissertation committee to be approved by the dissertation advisor at least one month prior to the dissertation defense. The committee must have a minimum of three members, in addition to the primary advisor. The primary dissertation advisor and at least one other committee member must be faculty members in the Department of Chemical Engineering. Additionally, one of the committee members must be external to the Department of Chemical Engineering. Committee membership is not limited to faculty at Northeastern University, nor to engineering faculty. The student is encouraged to consider experts in the dissertation topic and to work with the dissertation advisor to create a meaningful and helpful committee. The dissertation committee will approve the dissertation in its final form. The graduate school requirements for dissertation formatting and electronic submittal

instructions can be found on the College of Engineering's webpage (http://www.coe.neu.edu/student-services/dissertation/thesis-instructions). Students are responsible for contacting the Graduate School of Engineering for any updates to dissertation requirements and appropriate deadlines.

Dissertation Defense and Final Oral Examination

This comprehensive examination includes the public dissertation defense as well as a final oral examination to include the subject matter of the doctoral dissertation and significant developments in the field of the dissertation work. The oral presentation will be open to the public, including students, faculty, and the student's committee.

Departure Prior to Dissertation Completion

Occasionally, students have to leave the Department of Chemical Engineering prior to completion of all degree requirements. In such instances, a student cannot submit a dissertation for credit beyond three years after he or she stops actively pursuing the research. Exceptions may be granted upon petition to the departmental graduate committee. Petitions must demonstrate extenuating circumstances and prove that the research is still of value to the profession.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

General Requirements

A minimum of 24 semester hours of academic course work is required. Independent study credits do not count toward the 24 required semester hours.

Core		
A cumulative 3.500 GPA is required for the core.		
CHME 7320	Chemical Engineering Mathematics	4
CHME 7330	Chemical Engineering Thermodynamics	4
CHME 7340	Chemical Engineering Kinetics	4
CHME 7350	Transport Phenomena	4
Seminar		
Must be taken each semester:		
CHME 7390	Seminar	
Electives		
Requires 8 semester hours. Consult your faculty advisor for acceptable courses.		8
Dissertation		
Complete the following (repeatable) course twice:		
CHME 9990	Dissertation	

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Chemical Engineering, PhD—Advanced Entry

Each student admitted to the PhD program in chemical engineering will initially be designated a *doctoral student.* Upon successful completion of the requirements for doctoral candidacy as described below, a student is reclassified as a *doctoral candidate.* After establishing candidacy, a student must complete a program of academic course work and a dissertation under the direction of a dissertation advisor. All doctoral candidates must also pass a final oral examination.

Qualifying for Doctoral Candidacy

To qualify for doctoral candidacy, the student must demonstrate mastery of the four core areas of chemical engineering (thermodynamics, kinetics, transport, and mathematics) through course performance. To become a doctoral candidate, students must have no grades below a B and must maintain a grade-point average (GPA) of 3.500 or above, typically at the end of the first year, as an average considering all four core courses.

In addition, each student must also demonstrate critical thinking, analysis, and experimental planning skills related to their dissertation research topic through a written candidacy proposal and an oral defense of this proposal. The student must pass, as determined by the student's dissertation committee, this oral candidacy proposal defense in order to advance to doctoral candidacy. The oral presentation will be open to students, faculty, and the student's committee. The student earns the classification of *doctoral candidate* upon successful completion of these requirements.

Course Requirements

A minimum of 24 semester hours (SH) of academic course work, **not including any independent study credits,** beyond the master's degree is required. The 24 SH must include at least 16 SH of academic course work (exclusive of thesis or dissertation) taken at Northeastern University. All four of the core courses (see table under Program Requirements tab) must be included in the student's academic graduate course work.

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Candidacy Preparation—Doctoral (CHME 8960), can be taken if needed to fulfill full-time course registration. The course is an individual instruction course, billed at 1 SH, and graded S or U. There is no course content, and students must register in a section with their research or academic advisor as the "instructor."

After reaching PhD candidacy, students are required to register for Dissertation (CHME 9990) for two consecutive semesters. This is then followed by registration for Dissertation Continuation (CHME 9996) in each semester thereafter until the dissertation has been completed and defended.

Note: **No course credits are awarded for Dissertation (CHME 9990) or Dissertation Continuation (CHME 9996); however, a student is considered full-time if registered for either of these courses.** All students pursuing a doctoral degree must enroll in the department's seminar course for each semester they are matriculating toward their degree.

Students will be advised on their courses for the first semester by the associate chair of the Department of Chemical Engineering. After the first semester, students will work with their dissertation advisor to determine appropriate courses and course schedule to meet their educational needs and aspirations. Upon consultation with the dissertation advisor, a student may take up to 44 SH of course credit without additional financial penalty. Students and dissertation advisors should keep in mind that the requirements for doctoral candidacy include all four core courses and the

proposal defense and that the university residency requirement requires two semesters of academic studies after becoming a doctoral candidate.

Language Requirement

There is no foreign language requirement for the Doctor of Philosophy degree. However, each candidate must be proficient in technical writing and oral presentation in the English language. The graduate committee may require additional course work to improve language proficiency, if necessary.

Residence Requirement

A student satisfies the residence requirement by completing one academic year of full-time graduate studies during two consecutive academic semesters after qualifying for doctoral candidacy. Additional required course work (exclusive of seminars) may be completed during this period. Students are required to be continually enrolled while pursuing the completion of the dissertation.

Dissertation

After a student establishes doctoral candidacy, he or she must complete a dissertation that embodies the results of extended original research and includes material suitable for publication. The student is responsible for proposing a dissertation committee to be approved by the dissertation advisor at least one month prior to the dissertation defense. The committee must have a minimum of three members, in addition to the primary advisor. The primary dissertation advisor must be a faculty member in the Department of Chemical Engineering. Additionally, one of these committee members must be external to the Department of Chemical Engineering. Committee membership is not limited to faculty at Northeastern University, nor to engineering faculty. The student is encouraged to consider experts in the dissertation topic and to work with the dissertation advisor to create a meaningful and helpful committee. The dissertation committee will approve the dissertation in its final form. Required dissertation format is the same as for the MS thesis, and the graduate school requirements and electronic submittal instructions can be found on the College of Engineering website (http://www.coe.neu.edu/student-services/dissertation/thesis-instructions). Students are responsible for contacting the Graduate School of Engineering for any updates to dissertation requirements and appropriate deadlines.

Dissertation Defense and Final Oral Examination

This comprehensive examination includes the public dissertation defense as well as a final oral examination to include the subject matter of the doctoral dissertation and significant developments in the field of the dissertation work. The oral presentation will be open to the public, including students, faculty, and the student's committee.

Departure Prior to Dissertation Completion

Occasionally, students have left the Department of Chemical Engineering prior to completion of all degree requirements. In such instances, a student cannot submit a dissertation for credit beyond three years after he or she stops actively pursuing the research. Exceptions may be granted upon petition to the departmental graduate committee. Petitions must demonstrate extenuating circumstances and prove that the research is still of value to the profession.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

General Requirements

A minimum of 24 semester hours of academic course work is required. Independent study credits do not apply to the 24 required semester hours.

Core		
A cumulative 3.500 GPA is required for the core.		
CHME 7320	Chemical Engineering Mathematics	4
CHME 7330	Chemical Engineering Thermodynamics	4
CHME 7340	Chemical Engineering Kinetics	4
CHME 7350	Transport Phenomena	4
Seminar		
Must be taken each semester:		
CHME 7390	Seminar	
Electives		
Requires 8 semester hours. Consult your faculty advisor for acceptable courses.		8
Dissertation		
Complete the following (repeatable) course twice:		
CHME 9990	Dissertation	

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Chemical Engineering, MSCHE

The Master of Science in Chemical Engineering is normally pursued by students with a Bachelor of Science in Chemical Engineering or closely allied fields. Students wishing to pursue the master's degree but with undergraduate educational backgrounds other than chemical engineering may be required to complete supplementary undergraduate course work. These courses are in addition to the minimum course requirements. Students enrolled in the program are encouraged to seek guidance from their instructors and advisor regarding additional course work that may supplement the graduate curriculum.

Students originally admitted to the master's degree program who wish to switch to the PhD program must petition the associate chair for graduate studies and follow the procedure detailed under the administrative procedure section (p. 112) for the College of Engineering. If admission is granted, then the student must satisfy all the requirements of the doctoral degree program, including the requirements for doctoral candidacy.

Course Requirements

A minimum of 32 semester hours of academic work is required to qualify for the Master of Science degree in chemical engineering.

If pursuing a thesis option, at least 8 semester hours of thesis credit must be included as part of these 32 semester hours of credits. In addition, each student pursuing a thesis option must enroll in the department's seminar course for each semester they are matriculating toward their degree. Students enrolled in the department's seminar course are encouraged to participate in the seminar by providing a research presentation regarding their research project under the guidance of their advisor. The faculty advisor and the student establish

the sequence of courses that students take to pursue the Master of Science in Chemical Engineering.

If pursuing a nonthesis option, students must complete a minimum of 32 semester hours of course work and no enrollment in the seminar course is required. See required core courses and example elective courses for all graduate students (p. 128).

Degree Requirements	Thesis Option	Nonthesis Option
Required core courses	16 SH	16 SH
Master of Science thesis	8 SH	N/A
Seminar	0 SH	N/A
Elective courses [1]	8 SH	16 SH
Minimum semester hours required [2]	**32 SH**	**32 SH**

1 Students may complete a maximum of 8 semester hours (thesis option) or 12 semester hours (nonthesis options) of course work for credit outside the Department of Chemical Engineering under the guidance of their advisor and approval of the chemical engineering graduate program director.

2 Exclusive of any preparatory undergraduate courses.

Thesis Requirements

Students pursuing a Master of Science in Chemical Engineering with thesis must submit to the Graduate School of Engineering a written thesis that is approved by the thesis committee and department chair. See the graduate school requirements and electronic submittal instructions (http://www.coe.neu.edu/student-services/dissertation/thesis-instructions). MS with thesis students must also complete an oral master's thesis defense in order to successfully complete the program. The student will be expected to form a master's thesis committee, composed of a minimum of three members—one who is the advisor, one other faculty member from the chemical engineering department, and one member from outside the department. The oral presentation will be open to the public, including students, faculty, and the candidate's committee.

Part-time Students

Part-time students may progress according to their plans and time constraints but within the seven-year time limit. A minimum of 32 semester hours of academic course work is required for part-time students. The thesis and seminar course are not required for part-time students pursuing a master's degree.

Master of Science students wishing to change their status from part-time to full-time must notify the chemical engineering department and make a formal petition to the Graduate School of Engineering. Refer to the regulations of the Graduate School of Engineering for further information on academic administrative policies.

Departure Prior to Thesis Completion

Occasionally, students have to leave the chemical engineering department prior to completion of all degree requirements. In such instances, longtime intervals have often elapsed before thesis or manuscript submission. Accordingly, the department has adopted the guideline that a student cannot submit a thesis for credit beyond three years after the student stops actively pursuing the research. Exceptions may be granted upon petition to the departmental graduate committee. Petitions must demonstrate extenuating circumstances and prove that the research is still of value to the profession.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information, please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Chemical Engineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Chemical Engineering in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved chemical engineering technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

CHME 7320	Chemical Engineering Mathematics	4
CHME 7330	Chemical Engineering Thermodynamics	4
CHME 7340	Chemical Engineering Kinetics	4
CHME 7350	Transport Phenomena	4

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 16 semester hours from the course list below. (p. 128)	16

THESIS OPTION

Thesis

Complete 8 semester hours from the following (CHME 7990 is repeatable):		8
CHME 7390	Seminar	
CHME 7990	Thesis	

Electives

Complete 8 semester hours from the course list below. (p. 128)	8

Course List

CHME 5204	Heterogeneous Catalysis
CHME 5510	Fundamentals in Process Safety Engineering
CHME 5520	Process Safety Engineering—Chemical Reactivity, Reliefs, and Hazards Analysis
CHME 5630	Biochemical Engineering
CHME 6610	Computational Programs in Process Safety for Relief and Scenario Modeling
CHME 7201	Fluid Mechanics
CHME 7202	Chemical Process Heat Transfer

CHME 7205	Numerical Techniques in Chemical Engineering
CHME 7210	Advanced Chemical Engineering Calculations
CHME 7220	Electronic Materials, Thin Films, and Nanostructures
CHME 7221	Thin Film Technology
CHME 7222	Principals of Membrane Processes
CHME 7231	Chemical Process Dynamics and Control
CHME 7240	Polymer Science
CHME 7260	Special Topics in Chemical Engineering
CHME 7261	Special Topics in Chemical Engineering
CHME 7262	Special Topics in Process Safety
CHME 7978	Independent Study
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
ENGR 6150	Nanotechnology in Engineering

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Process Safety Engineering, Graduate Certificate

The Graduate Certificate in Process Safety Engineering focuses on the integration of chemical engineering skills with the knowledge of process safety and regulation with specific attention on designing and developing solutions for industrial firms with the goal of creating environments that are safer and in compliance with regulatory rules and regulations.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of chemical engineering knowledge and skills to lead efforts within companies to plan and implement process safety designs that assist in meeting the regulatory requirements and confirming code compliance within an industrial firm in order to maintain the safety, health, and welfare of their employees and the public as well as making industrial firms safer and profitable.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Process Safety		
CHME 5510	Fundamentals in Process Safety Engineering	4
CHME 5520	Process Safety Engineering—Chemical Reactivity, Reliefs, and Hazards Analysis	4
Relief and Scenario Modeling		
CHME 6610	Computational Programs in Process Safety for Relief and Scenario Modeling	4
Special Topics		
CHME 7262	Special Topics in Process Safety	4

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Civil and Environmental Engineering

Website (http://www.civ.neu.edu)

Jerome F. Hajjar, PhD, PE
CDM Smith Professor and Chair

400 Snell Engineering Center
617.373.2444
617.373.4419 (fax)
Jerome F. Hajjar, CDM Smith Professor and Chair,
jf.hajjar@northeastern.edu

Having a range of teaching and research strengths, anchored by several multidisciplinary, multi-institutional centers and programs that are core to the activities of the department, our department's strategic focus on urban engineering prepares future master's and PhD graduates for many of the greatest challenges of our time. Also, building on current strengths and expanding into new and vital areas in civil and environmental engineering, three overarching themes are highlighted in our department, including environmental health, civil Infrastructure security, and sustainable resource engineering, all aligned with four premier departmental strengths in simulation (both computational and experimental), smart sensing, data and network science, and urban informatics.

The Department of Civil and Environmental Engineering offers research and educational programs at both MS and PhD levels. We offer graduate programs leading to the degrees of Master of Science in Civil Engineering, Master of Science in Environmental Engineering, Master of Science in Engineering and Public Policy, and Master of Science in Sustainable Building Systems. Our cutting-edge doctoral programs include a PhD in civil engineering and an interdisciplinary PhD. Both programs are flexible and may be adapted to any subject area in civil and environmental engineering, including interdisciplinary options within the department or across departments or colleges.

Master of Science Degree

Northeastern's Department of Civil and Environmental Engineering's strategic focus on urban engineering gives our graduates the opportunity to make a real-world impact on and make long-lasting contributions to the well-being and development of society. Within our graduate programs, students work alongside world-class faculty on advanced research and courses, developing a solid base for their careers. All civil and environmental engineering master's programs are available on a full-time or part-time basis. Options for a master's thesis or report in place of course work are available. At the master's level, the following degrees are offered:

1. Master of Science in Civil Engineering with concentration in:

   - Construction management
   - Environmental and water systems
   - Geotechnical/geoenvironmental engineering
   - Structural engineering
   - Transportation

2. Master of Science in Environmental Engineering

3. Master of Science in Engineering and Public Policy with concentration in:

- Energy and environment
- Infrastructure resilience

4. Master of Science in Sustainable Building Systems

Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum GPA of 3.000.

There are detailed course and degree requirements for different degree/concentration areas. Three types of courses fulfill the required semester hours, including required core courses, restricted electives, and other electives. Graduate courses that are not listed may also be considered as other electives; these courses require a petition approved by the concentration advisor via the Graduate School of Engineering petition system. Both full-time and part-time students should meet with a faculty advisor at least once during each semester of study to arrange for an appropriate sequence of courses to satisfy all degree requirements. Links to the individual concentrations may be found under the Programs tab.

Graduate Certificate Options

Students enrolled in a master's degree have the opportunity to also pursue one of the many engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering Leadership Program (p. 204) in combination with the MS degree.

Doctor of Philosophy (PhD) Degree

The Department of Civil and Environmental Engineering admits applicants to the PhD program either directly after earning a suitable bachelor's degree (bachelor's entry) or after earning a master's degree (advanced entry). Upon acceptance into the program, an applicant is designated as a doctoral student. This designation is changed to doctoral candidate upon successful completion of the doctoral qualifying examinations (both written and oral area exams) and all the required course work.

The doctoral program is designed to be flexible with respect to subject area. Since the PhD is primarily a research degree, the program must be adaptable to changes in research needs. The PhD is awarded to students who demonstrate high academic achievement and research competence in the field of civil engineering. Students must pursue the PhD program on a basis consistent with the residence requirements for the degree that may be found under the Degree Requirements tab.

Programs

Doctor of Philosophy (PhD)

- Civil Engineering (p. 130)
- Civil Engineering—Advanced Entry (p. 131)

Master of Science (MS)

- Engineering and Public Policy with Concentration in Energy and Environment (p. 132)
- Engineering and Public Policy with Concentration in Infrastructure Resilience (p. 133)

Master of Science in Civil Engineering (MSCivE)

- Civil Engineering with Concentration in Construction Management (p. 135)
- Civil Engineering with Concentration in Environmental and Water Systems (p. 136)
- Civil Engineering with Concentration in Geotechnical/Geoenvironmental Engineering (p. 137)
- Civil Engineering with Concentration in Structural Engineering (p. 138)
- Civil Engineering with Concentration in Transportation (p. 139)

Master of Science in Environmental Engineering (MSENVE)

- Environmental Engineering (p. 140)

Master of Science in Sustainable Building Systems (MSSBS)

- Sustainable Building Systems (p. 141)

Civil Engineering, PhD

Awarding of the Doctor of Philosophy degree is based on exceptional performance in course work as well as evidence of ability to formulate and execute original research. The PhD program has two components:

1. An academic program of graduate-level courses that provides depth in a specific area of civil engineering (the major field) as well as other course work that provides additional exposure at an advanced level to one or more disciplines
2. The dissertation, an extended independent research effort on a relevant technical problem resulting in an original contribution to the field

Each student's mastery of subject matter is measured by a qualifying examination covering a subset of subjects selected from the major field. A doctoral dissertation committee periodically monitors research progress, and the candidate is required to present and defend his or her research results before the doctoral dissertation committee upon completion of the work.

Course Work Requirement

The academic program must include at least 52 semester hours of graduate-level course work beyond the bachelor's degree. Students with a master's degree in civil engineering must complete a minimum of 20 semester hours of course work at Northeastern University. A student may count no more than 4 semester hours of independent study (such as special project in civil engineering) toward the minimum course requirements. A minimum of 40 semester hours must be related to the major field but may include courses from other departments when appropriate.

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Exam Preparation—Doctoral (CIVE 8960), can be taken if needed to fulfill full-time course registration. The course is an individual instruction course, billed at 1 semester hour, and graded S or U. There is no course content, and students must register in a section with their research or academic advisor as the "instructor."

Upon successful completion of the qualifying exam and the majority of required course work, each doctoral candidate must register in two consecutive semesters for Dissertation (CIVE 9990). Upon completion of this sequence, the candidate must register for Dissertation Continuation (CIVE 9996) in every semester until the dissertation is complete. Students

may not register for Continuation until they fulfill the two-semester dissertation sequence.

Qualifying Examination and Degree Candidacy

The qualifying exam includes written and oral components. Its content depends upon the educational background and objectives of the student. In general, the written component covers subject matter at the master's degree level selected from the major field and includes basic engineering and science disciplines, as well as civil engineering application areas. The oral component measures general comprehension and aptitude for research. If a student fails the exam, he or she may retake it one time with the permission of the qualifying examination committee.

PhD students who start their graduate program at Northeastern with a BS degree shall take the qualifying exam within the first 30 months after entering the program. Upon successful completion of the exam and all required course work, the student is classified as a doctoral candidate.

Comprehensive Examination

The comprehensive exam is a defense of the doctoral research work and an examination on subject matter related to the dissertation area.

Dissertation

Once degree candidacy is established, a doctoral candidate may proceed with his or her dissertation. The candidate must write a dissertation proposal and name a civil and environmental engineering (CEE) faculty member as the dissertation advisor. A doctoral dissertation committee formed by the student and his or her dissertation advisor will monitor progress and approve the final document. The doctoral dissertation committee shall have no fewer than four members, at least two of whom must be full-time faculty from the CEE department.

Each student, along with a faculty advisor, must jointly develop a proposal defining the content of the academic program, subject to review by the qualifying examination committee. Intellectual rigor, connectivity of subject matter, and compatibility with departmental interests are critical issues. The doctoral dissertation committee's approval of the proposal represents a mutual agreement between the student and the committee. The CEE department encourages flexibility in program definition, especially in areas where complementary courses exist in other departments or where expertise resides outside the department and where the objective is to introduce new technology in civil engineering practice.

Each doctoral candidate must defend his or her dissertation within seven years from the start of the PhD program.

Residence Requirement

After achieving PhD candidacy, students must complete at least two successive semesters of full-time study on campus to establish residence. The total effort for a PhD program involves a minimum of three years of full-time work beyond the bachelor's degree. Students who enter the doctoral program with a Master of Science degree may complete the requirements in less time but should anticipate at least two years of full-time effort.

Language Requirement

Each doctoral candidate must be proficient in technical writing and oral presentation in the English language. The qualifying examination committee may require additional course work in the case of any deficiency in these areas.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination and comprehensive examination
Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

Course Work Requirement

Complete 52 semester hours of approved course work. Consult your faculty advisor for acceptable courses. Please note that a maximum of 4 semester hours of Independent Study (CIVE 7978) will be accepted toward the 52-semester-hour requirement.

Dissertation Courses

Complete the following (repeatable) course twice:

CIVE 9990	Dissertation

Program Credit/GPA Requirements

52 total semester hours required
Minimum 3.000 GPA required

Civil Engineering, PhD—Advanced Entry

Awarding of the Doctor of Philosophy degree is based on exceptional performance in course work as well as evidence of ability to formulate and execute original research. The PhD program has two components:

1. An academic program of graduate-level courses that provides depth in a specific area of civil engineering (the major field) as well as other course work that provides additional exposure at an advanced level to one or more disciplines
2. The dissertation, an extended independent research effort on a relevant technical problem resulting in an original contribution to the field

Each student's mastery of subject matter is measured by a qualifying examination covering a subset of subjects selected from the major field. A doctoral dissertation committee periodically monitors research progress, and the candidate is required to present and defend his or her research results before the doctoral dissertation committee upon completion of the work.

Course Work Requirement

The academic program must include at least 52 semester hours of graduate-level course work beyond the bachelor's degree. Students with a master's degree in civil engineering must complete a minimum of 20 semester hours of course work at Northeastern University. A student may count no more than 4 semester hours of independent study (such as special project in civil engineering) toward the minimum course requirements. A minimum of 40 semester hours must be related to the major field but may include courses from other departments when appropriate.

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Exam Preparation—Doctoral (CIVE 8960), can be taken if needed to fulfill full-time course registration. The course is an individual instruction course, billed at 1 semester hour, and graded S

or U. There is no course content, and students must register in a section with their research or academic advisor as the "instructor."

Upon successful completion of the qualifying exam and the majority of required course work, each doctoral candidate must register in two consecutive semesters for Dissertation (CIVE 9990). Upon completion of this sequence, the candidate must register forDissertation Continuation (CIVE 9996) in every semester until the dissertation is complete. Students may not register for Continuation until they fulfill the two-semester dissertation sequence.

Qualifying Examination and Degree Candidacy

The qualifying exam includes written and oral components. Its content depends upon the educational background and objectives of the student. In general, the written component covers subject matter at the master's degree level selected from the major field and includes basic engineering and science disciplines, as well as civil engineering application areas. The oral component measures general comprehension and aptitude for research. If a student fails the exam, he or she may retake it one time with the permission of the qualifying examination committee.

Students must take the qualifying exam during the first 18 months of their PhD program. Upon successful completion of the exam and all required course work, the student is classified as a doctoral candidate.

Comprehensive Examination

The comprehensive exam is a defense of the doctoral research work and an examination on subject matter related to the dissertation area.

Dissertation

Once degree candidacy is established, a doctoral candidate may proceed with his or her dissertation. The candidate must write a dissertation proposal and name a civil and environmental engineering faculty member as the dissertation advisor. A doctoral dissertation committee formed by the student and his or her dissertation advisor will monitor progress and approve the final document. The doctoral dissertation committee shall have no fewer than four members, at least two of whom must be full-time faculty from the Department of Civil and Environmental Engineering (CEE).

Each student, along with a faculty advisor, must jointly develop a proposal defining the content of the academic program, subject to review by the qualifying examination committee. Intellectual rigor, connectivity of subject matter, and compatibility with departmental interests are critical issues. The doctoral dissertation committee's approval of the proposal represents a mutual agreement between the student and the committee. The CEE department encourages flexibility in program definition, especially in areas where complementary courses exist in other departments or where expertise resides outside the department and where the objective is to introduce new technology in civil engineering practice.

Each doctoral candidate must defend his or her dissertation within seven years from the start of the PhD program.

Residence Requirement

After achieving PhD candidacy, students must complete at least two successive semesters of full-time study on campus to establish residence. The total effort for a PhD program involves a minimum of three years of full-time work beyond the bachelor's degree. Students who enter the doctoral program with a Master of Science degree may complete the requirements in less time but should anticipate at least two years of full-time effort.

Language Requirement

Each doctoral candidate must be proficient in technical writing and oral presentation in the English language. The qualifying examination committee may require additional course work in the case of any deficiency in these areas.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination and comprehensive examination
Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

General Requirements

Complete 20 semester hours of approved course work. Consult your faculty advisor for acceptable courses. Please note that a maximum of 4 semester hours of Independent Study (CIVE 7978) will be accepted toward the 20-semester-hour requirement.

Dissertation Courses

Complete the following (repeatable) course twice:

CIVE 9990	Dissertation

Program Credit/GPA Requirements

20 total semester hours required
Minimum 3.000 GPA required

Engineering and Public Policy with Concentration in Energy & Environment, MS

The purpose of this degree is to provide students with a background in engineering with the tools necessary to conduct robust policy analysis. It includes required core courses from the Department of Civil and Environmental Engineering and the School of Public Policy, complemented by electives in engineering and public policy, which can be met by two courses and a master's report (recommended), or by one course and a thesis, or by three courses. A minimum of 16 semester hours must be taken in the College of Engineering.

Degree Requirements	With Report	With Thesis	Course Work Only
Required core courses	20 SH	20 SH	20 SH
Other electives	8 SH	4 SH	12 SH
Master of Science report/ thesis	4 SH	8 SH	
Minimum semester hours required	32 SH	32 SH	32 SH

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Engineering and Public Policy with a Concentration in Energy and Environment with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Engineering and Public Policy with a Concentration in Energy and Environment in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16 semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 36-semester-hour degree and certificate will require 20 hours of advisor-approved energy and environment technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

Energy and Environment		
CIVE 7272	Air Quality Management	4
or ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage	
Environmental Systems Modeling		
Complete 4 semester hours from the following:		4
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
CIVE 7388	Special Topics in Civil Engineering (Agent-Based Modeling)	
CIVE 5261	Dynamic Modeling for Environmental Investment and Policymaking	
Economics		
Complete 4 semester hours from the following:		4
PPUA 5260	Ecological Economics	
ECON 7210	Applied Microeconomic Policy Analysis	
LPSC 6313	Economic Analysis for Law, Policy, and Planning	
Public Policy and Analysis		
Complete 4 semester hours from the following:		4
LPSC 7311	Strategizing Public Policy	
PPUA 6506	Techniques of Policy Analysis	
PPUA 6509	Techniques of Program Evaluation	
Statistics		
Complete 4 semester hours from the following:		4
CIVE 7100	Applied Time Series and Spatial Statistics	
IE 6200	Engineering Probability and Statistics	
IE 7280	Statistical Methods in Engineering	
LPSC 7215	Advanced Quantitative Techniques	

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 12 semester hours from the Energy and Environment Course List below.		12

REPORT OPTION

Complete 8 semester hours from the Energy and Environment Course List below.		8
CIVE 8674	Master's Report	4

THESIS OPTION

Complete 4 semester hours from the Energy and Environment Course List below.		4
CIVE 7990	Thesis	8

Energy and Environment Course List

Any required core course not used to meet the required core course requirement can be taken as a restricted elective.

CIVE 5270	Environmental Protection and Management
CIVE 5271	Solid and Hazardous Waste Management
CIVE 5280	Remote Sensing of the Environment
CIVE 5300	Environmental Engineering Laboratory
CIVE 7252	Water Engineering, Resources, and Energy Recovery
CIVE 7261	Surface Water Quality Modeling
CIVE 7263	Groundwater Quality Modeling
CIVE 7388	Special Topics in Civil Engineering (Urban Informatics)
CIVE 7392	Special Topics in Environmental Engineering (Hydraulic Engineering)
EMGT 6225	Economic Decision Making
ENVR 5210	Environmental Planning
ENVR 5260	Geographical Information Systems
ME 5645	Environmental Issues in Manufacturing and Product Use
IE 5500	Systems Engineering in Public Programs
IE 5640	Data Mining for Engineering Applications
PPUA 5262	Big Data for Cities
PPUA 5263	Geographic Information Systems for Urban and Regional Policy
PPUA 7235	Urban and Regional Policy and Planning in Developing Countries
PPUA 7237	Advanced Spatial Analysis of Urban Systems

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Engineering and Public Policy with Concentration in Infrastructure Resilience, MS

The purpose of this degree is to provide students with a background in engineering with the tools necessary to conduct robust policy analysis. It includes required core courses from the Department of

Civil and Environmental Engineering and the School of Public Policy, complemented by electives in engineering and public policy, which can be met by two courses and a master's report (recommended), or by one course and a thesis, or by three courses. A minimum of 16 semester hours must be taken in the College of Engineering.

Degree Requirements	With Report	With Thesis	Course Work Only
Required core courses	20 SH	20 SH	20 SH
Other electives	8 SH	4 SH	12 SH
Master of Science report/ thesis	4 SH	8 SH	
Minimum semester hours required	32 SH	32 SH	32 SH

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Engineering and Public Policy with a Concentration in Infrastructure Resilience with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Engineering and Public Policy with a Concentration in Infrastructure Resilience in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16 semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 36-semester-hour degree and certificate will require 20 hours of advisor-approved infrastructure resilience technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

Infrastructure Resilience		
CIVE 7110	Critical Infrastructure Resilience	4
Environmental Systems Modeling		
Complete 4 semester hours from the following:		4
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
CIVE 5261	Dynamic Modeling for Environmental Investment and Policymaking	
CIVE 5280	Remote Sensing of the Environment	
CIVE 7388	Special Topics in Civil Engineering (Urban Informatics)	
CIVE 7392	Special Topics in Environmental Engineering (Agent-Based Modeling)	
Economics		
Complete 4 semester hours from the following:		4
ECON 7210	Applied Microeconomic Policy Analysis	
LPSC 6313	Economic Analysis for Law, Policy, and Planning	
Public Policy and Analysis		
Complete 4 semester hours from the following:		4
LPSC 7311	Strategizing Public Policy	
PPUA 6506	Techniques of Policy Analysis	
PPUA 6509	Techniques of Program Evaluation	
Statistics		
Complete 4 semester hours from the following:		4
CIVE 7100	Applied Time Series and Spatial Statistics	
IE 6200	Engineering Probability and Statistics	
IE 7280	Statistical Methods in Engineering	
LPSC 7215	Advanced Quantitative Techniques	

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 12 semester hours from the infrastructure course list below.		12

REPORT OPTION

Complete 8 semester hours from the infrastructure course list below.		8
CIVE 8674	Master's Report	4

THESIS OPTION

Complete 4 semester hours from the infrastructure course list below.		4
CIVE 7990	Thesis	8

Infrastructure Course List

Any required core course not used to meet the required core course requirement can be taken as a restricted elective.

EMGT 6225	Economic Decision Making
ENVR 5260	Geographical Information Systems
IA 5250	Decision Making for Critical Infrastructure
IE 5500	Systems Engineering in Public Programs
IE 5640	Data Mining for Engineering Applications
IE 7290	Reliability Analysis and Risk Assessment
ME 5645	Environmental Issues in Manufacturing and Product Use
PPUA 5260	Ecological Economics
PPUA 5262	Big Data for Cities
PPUA 5263	Geographic Information Systems for Urban and Regional Policy
PPUA 6524	Case Studies in Policy Analysis
PPUA 7230	Housing Policy
PPUA 7231	Transportation Policy
PPUA 7234	Land Use and Urban Growth Policy
PPUA 7235	Urban and Regional Policy and Planning in Developing Countries

PPUA 7237	Advanced Spatial Analysis of Urban Systems
PPUA 7239	Problems in Metropolitan Policymaking
PPUA 7240	Health Policy and Politics

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Civil Engineering with Concentration in Construction Management, MSCivE

This program is intended for students interested in construction management and engineering or a closely related field. It includes required core courses primarily from the Department of Civil and Environmental Engineering, complemented by electives in civil and environmental engineering and other departments such as mechanical and industrial engineering and business administration. Based on proven proficiency in given areas, students may waive certain core courses and replace them with alternate elective courses.

Degree Requirements	With Report	With Thesis	Course Work Only
Required core courses	18 SH	18 SH	18 SH
Elective courses	10 SH	6 SH	14 SH
Master of Science report/ thesis	4 SH	8 SH	
Minimum semester hours required	**32 SH**	**32 SH**	**32 SH**

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Civil Engineering with a Concentration in Construction Management with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Civil Engineering with a Concentration in Construction Management in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 33-semester-hour degree and certificate will require 17 hours of advisor-approved construction management technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

CIVE 5221	Construction Project Control and Organization	2
CIVE 7220	Construction Management	4
CIVE 7230	Legal Aspects of Civil Engineering	4
EMGT 6305	Financial Management for Engineers	4
IE 6200	Engineering Probability and Statistics	4

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 14 semester hours from the course list below.		14

REPORT OPTION

CIVE 8674	Master's Report	4
Complete 10 semester hours from the course list below.		10

THESIS OPTION

CIVE 7990	Thesis	8
Complete 6 semester hours from the course list below.		6

Course List

OR 6205	Deterministic Operations Research
ACCT 6200	Financial Reporting and Managerial Decision Making 1
ACCT 6201	Financial Reporting and Managerial Decision Making 2
CIVE 5231	Alternative Project Delivery Systems in Construction
CIVE 7240	Construction Equipment and Modeling
CIVE 7301	Advanced Soil Mechanics
CIVE 7302	Advanced Foundation Engineering
EMGT 5300	Engineering/Organizational Psychology
GE 5010	Customer-Driven Technical Innovation for Engineers
GE 5100	Product Development for Engineers
IE 5640	Data Mining for Engineering Applications
or IE 7275	Data Mining in Engineering
IE 7215	Simulation Analysis
IE 7290	Reliability Analysis and Risk Assessment
IE 7615	Neural Networks in Engineering
INFO 6210	Data Management and Database Design
INFO 6215	Business Analysis and Information Engineering
INFO 6245	Planning and Managing Information Systems Development
SBSY 5300	Information Systems for Integrated Project Delivery

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Civil Engineering with Concentration in Environmental and Water Systems, MSCIVE

This program integrates the study of infrastructure; hydrology; hydraulics; numerical modeling; remote sensing; spatial and temporal data analysis; and physical, chemical, and biological processes that impact the water and air quality to provide students with the knowledge and tools for developing and managing sustainable, resilient water resources and infrastructure. It includes required core courses from the Department of Civil and Environmental Engineering, complemented by electives in electrical and computer engineering, mechanical and industrial engineering, and earth and environmental sciences.

Degree Requirements	With Report	With Thesis	Course Work Only
Required core courses	8 SH	8 SH	8 SH
Restricted electives	12 SH	12 SH	12 SH
Other electives	8 SH	4 SH	12 SH
Master of Science report/ thesis	4 SH	8 SH	
Minimum semester hours required	**32 SH**	**32 SH**	**32 SH**

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Civil Engineering with a Concentration in Environmental and Water Systems with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Civil Engineering with a Concentration in Environmental and Water Systems in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved environmental and water systems technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

Complete two of the following:		8
CIVE 7250	Environmental Chemistry	
CIVE 7251	Environmental Biological Processes	
CIVE 7260	Hydrologic Modeling	
CIVE 7261	Surface Water Quality Modeling	
CIVE 7263	Groundwater Quality Modeling	
CIVE 7272	Air Quality Management	
CIVE 7392	Special Topics in Environmental Engineering (Hydraulic Modeling)	

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 12 semester hours from the Restricted Elective List below.		12
Complete 12 semester hours from the Other Elective List below.		12

REPORT OPTION

CIVE 8674	Master's Report	4
Complete 12 semester hours from the Restricted Elective List below.		12
Complete 8 semester hours from the Other Elective List below.		8

THESIS OPTION

CIVE 7990	Thesis	8
Complete 12 semester hours from the Restricted Elective List below.		12
Complete 4 semester hours from the Other Elective List below.		4

Course Lists

RESTRICTED ELECTIVE LIST

Any required core course not used to meet the required core course requirement can be taken as a restricted elective.

CIVE 5250	Organic Pollutants in the Environment
CIVE 5260	Environmental Fluid Mechanics
CIVE 5261	Dynamic Modeling for Environmental Investment and Policymaking
CIVE 5270	Environmental Protection and Management
CIVE 5271	Solid and Hazardous Waste Management
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure
CIVE 5280	Remote Sensing of the Environment
CIVE 5300	Environmental Engineering Laboratory
CIVE 5321	Geoenvironmental Engineering
CIVE 5536	Hydrologic Engineering
CIVE 6777	Climate Hazards and Resilient Cities Abroad
CIVE 6778	Climate Adaptation and Policy Abroad
CIVE 7100	Applied Time Series and Spatial Statistics
CIVE 7110	Critical Infrastructure Resilience
CIVE 7252	Water Engineering, Resources, and Energy Recovery
CIVE 7255	Environmental Physical/Chemical Processes
CIVE 7392	Special Topics in Environmental Engineering (Agent Based Modeling)

OTHER ELECTIVE LIST

Any required core course not used to meet the required core course or restricted elective requirements can be taken as another elective. Any restricted elective not used to meet the restricted elective requirement can be taken as another elective.

EECE 5626	Image Processing and Pattern Recognition
EECE 7204	Applied Probability and Stochastic Processes
ENVR 5260	Geographical Information Systems
EEMB 5516	Oceanography
IE 6200	Engineering Probability and Statistics
IE 7280	Statistical Methods in Engineering
IE 7290	Reliability Analysis and Risk Assessment
MATH 7341	Probability 2
MATH 7343	Applied Statistics
MATH 7344	Regression, ANOVA, and Design

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Civil Engineering with Concentration in Geotechnical/Geoenvironmental Engineering, MSCivE

This program includes study in the areas of soil mechanics/foundations and geoenvironmental engineering. It includes studies of soil and related earth materials for problems related to the protection of human health and the environment. Related areas include soil mechanics, fate/transport in subsurfaces, subsurface remediation, and others. The degree requirements include core courses from the Department of Civil and Environmental Engineering, complemented by electives in civil and environmental engineering, as well as electives from other departments such as mechanical and industrial engineering.

Degree Requirements	With Report	With Thesis	Course Work Only
Required core courses	8 SH	8 SH	8 SH
Elective courses	20 SH	16 SH	24 SH
Master of Science report/ thesis	4 SH	8 SH	
Minimum semester hours required	**32 SH**	**32 SH**	**32 SH**

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Civil Engineering with a Concentration in Geotechnical/Geoenvironmental Engineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Civil Engineering with a Concentration in Geotechnical/Geoenvironmental Engineering in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved geotechnical/geoenvironmental engineering technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

CIVE 7301	Advanced Soil Mechanics	4
CIVE 7302	Advanced Foundation Engineering	4

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 24 semester hours from the Elective Course List below.		24

REPORT OPTION

CIVE 8674	Master's Report	4
Complete 20 semester hours from the Elective Course List below.		20

THESIS OPTION

CIVE 7990	Thesis	8
Complete 16 semester hours from the Elective Course List below.		16

Elective Course List

CIVE 5270	Environmental Protection and Management
CIVE 5271	Solid and Hazardous Waste Management
CIVE 5321	Geoenvironmental Engineering
CIVE 5536	Hydrologic Engineering
CIVE 7230	Legal Aspects of Civil Engineering
CIVE 7240	Construction Equipment and Modeling
CIVE 7250	Environmental Chemistry
CIVE 7251	Environmental Biological Processes
CIVE 7260	Hydrologic Modeling
CIVE 7263	Groundwater Quality Modeling
CIVE 7311	Soil and Foundation Dynamics
CIVE 7312	Earthquake Engineering
CIVE 7330	Advanced Structural Analysis
CIVE 7331	Structural Dynamics
IE 6200	Engineering Probability and Statistics
IE 7290	Reliability Analysis and Risk Assessment
ME 5657	Finite Element Method

ME 7205	Advanced Mathematical Methods for Mechanical Engineers

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Civil Engineering with Concentration in Structural Engineering, MSCivE

This program is designed for students with career goals in structural engineering and structural design. The program includes courses in structural analysis and design, structural mechanics, dynamics of structures, earthquake engineering, wind engineering, and structural health monitoring. The degree requirements include core courses from the Department of Civil and Environmental Engineering, complemented by electives in civil and environmental engineering, as well as electives from other departments such as mechanical and industrial engineering and mathematics.

Degree Requirements	With Report	With Thesis	Course Work Only
Required core courses	8 SH	8 SH	8 SH
Restricted electives	12 SH	12 SH	12 SH
Other electives	8 SH	4 SH	12 SH
Master of Science report/ thesis	4 SH	8 SH	
Minimum semester hours required	**32 SH**	**32 SH**	**32 SH**

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Civil Engineering with a Concentration in Structural Engineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Civil Engineering with a Concentration in Structural Engineering in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved structural engineering technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

CIVE 7330	Advanced Structural Analysis	4
CIVE 7331	Structural Dynamics	4

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 12 semester hours from the Restricted Elective List below.		12
Complete 12 semester hours from the Other Elective List below.		12

REPORT OPTION

CIVE 8674	Master's Report	4
Complete 12 semester hours from the Restricted Elective List below.		12
Complete 8 semester hours from the Other Elective List below.		8

THESIS OPTION

CIVE 7990	Thesis	8
Complete 12 semester hours from the Restricted Elective List below.		12
Complete 4 semester hours from the Other Elective List below.		4

Course Lists

RESTRICTED ELECTIVE LIST

CIVE 5522	Structural Analysis 2
CIVE 7340	Seismic Analysis and Design
CIVE 7341	Structural Reliability
CIVE 7342	System Identification
CIVE 7350	Behavior of Concrete Structures
CIVE 7351	Behavior of Steel Structures
CIVE 7354	Wind Engineering
CIVE 7355	Advanced Bridge Design
CIVE 7396	Special Topics in Structural Engineering (Advanced Structural Mechanics)

OTHER ELECTIVE LIST

Any restricted elective not used to meet the restricted elective requirement can be taken as another elective.

CIVE 7301	Advanced Soil Mechanics
CIVE 7302	Advanced Foundation Engineering
CIVE 7311	Soil and Foundation Dynamics
CIVE 7312	Earthquake Engineering
MATH 7241	Probability 1
MATH 7342	Mathematical Statistics
MATH 7343	Applied Statistics
MATL 7365	Properties and Processing of Electronic Materials
ME 5240	Computer Aided Design and Manufacturing
ME 5650	Advanced Mechanics of Materials
ME 5655	Dynamics and Mechanical Vibration
ME 5657	Finite Element Method
ME 5659	Control Systems Engineering

ME 6200	Mathematical Methods for Mechanical Engineers 1
ME 6201	Mathematical Methods for Mechanical Engineers 2
ME 7205	Advanced Mathematical Methods for Mechanical Engineers
ME 7210	Elasticity and Plasticity
ME 7232	Theory of Plates and Shells
ME 7238	Advanced Finite Element Method
ME 7245	Fracture Mechanics and Failure Analysis
ME 7255	Continuum Mechanics

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Civil Engineering with Concentration in Transportation, MSCivE

This program is designed for students with career goals in transportation engineering and transportation planning. The degree requirements include core courses from the Department of Civil and Environmental Engineering, complemented by electives in civil and environmental engineering and by related courses in applied mathematics, engineering, economics, policy, and management.

Degree Requirements	With Report	With Thesis	Course Work Only
Required core courses	12 SH	12 SH	12 SH
Restricted electives	8 SH	8 SH	12 SH
Other electives	8 SH	4 SH	8 SH
Master of Science report/ thesis	4 SH	8 SH	
Minimum semester hours required	**32 SH**	**32 SH**	**32 SH**

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Civil Engineering with a Concentration in Transportation with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Civil Engineering with a Concentration in Transportation in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved transportation engineering technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

CIVE 5373	Transportation Planning and Engineering	4
CIVE 5376	Traffic Engineering	4
IE 6200	Engineering Probability and Statistics	4

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 12 semester hours from the Restricted Elective List below.		12
Complete 8 semester hours from the Other Elective List below.		8

REPORT OPTION

CIVE 8674	Master's Report	4
Complete 8 semester hours from the Restricted Elective List below.		8
Complete 8 semester hours from the Other Elective List below.		8

THESIS OPTION

CIVE 7990	Thesis	8
Complete 8 semester hours from the Restricted Elective List below.		8
Complete 4 semester hours from the Other Elective List below.		4

Course Lists

RESTRICTED ELECTIVE LIST

CIVE 6566	Sustainable Urban Transportation: Netherlands
CIVE 7380	Transportation Performance and Simulation Models
CIVE 7381	Transportation Demand Models
CIVE 7385	Public Transportation
CIVE 7387	Design Aspects of Roadway Safety
CIVE 7388	Special Topics in Civil Engineering (Informatics in Civil Engineering)
IE 7215	Simulation Analysis
IE 7280	Statistical Methods in Engineering

OTHER ELECTIVE LIST

Any restricted elective not used to meet the restricted elective requirement can be used as another elective. Courses outside this list may be taken as electives with advisor approval.

EECE 7313	Pattern Recognition
IE 7275	Data Mining in Engineering
IE 7290	Reliability Analysis and Risk Assessment
INFO 6210	Data Management and Database Design
MATH 7343	Applied Statistics

MATH 7347	Statistical Decision Theory
OR 6205	Deterministic Operations Research
OR 7230	Probabilistic Operation Research
OR 7245	Network Analysis and Advanced Optimization
PPUA 5263	Geographic Information Systems for Urban and Regional Policy
PPUA 7231	Transportation Policy
PPUA 7234	Land Use and Urban Growth Policy

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Environmental Engineering, MSENVE

This program integrates the study of physical, chemical, and biological processes and fundamental principles for water and wastewater treatment and disposal, hazardous waste management, surface water and groundwater quality, water resources management, and air quality management. Successful graduates will have the ability to develop and implement technologies for various environmental applications with the goal to improve and protect the environment and human health. It includes required core courses from the Department of Civil and Environmental Engineering (CEE), complemented by electives in civil and environmental engineering, mechanical and industrial engineering, earth and environmental sciences, and mathematics.

Degree Requirements	With Report	With Thesis	Course Work Only
Required core electives	12 SH	12 SH	12 SH
Restricted electives	8 SH	8 SH	12 SH
Other electives	8 SH	4 SH	8 SH
Master of Science report/ thesis	4 SH	8 SH	

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Environmental Engineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Environmental Engineering in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16 semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 36-semester-hour degree and certificate will require 20 hours of advisor-approved environmental engineering technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

Complete three of the following:		12
CIVE 7250	Environmental Chemistry	
CIVE 7251	Environmental Biological Processes	
CIVE 7252	Water Engineering, Resources, and Energy Recovery	
CIVE 7255	Environmental Physical/Chemical Processes	
CIVE 7260	Hydrologic Modeling	

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 12 semester hours from the Restricted Electives List below.		12
Complete 8 semester hours from the Other Electives List below.		8

REPORT OPTION

CIVE 8674	Master's Report	4
Complete 8 semester hours from the Restricted Electives List below.		8
Complete 8 semester hours from the Other Electives List below.		8

THESIS OPTION

CIVE 7990	Thesis	8
Complete 8 semester hours from the Restricted Electives List below.		8
Complete 4 semester hours from the Other Electives List below.		4

Course Lists

RESTRICTED ELECTIVES LIST

Any required core course not used to meet the required core course requirement can be taken as a restricted elective.

CIVE 5250	Organic Pollutants in the Environment
CIVE 5260	Environmental Fluid Mechanics
CIVE 5261	Dynamic Modeling for Environmental Investment and Policymaking
CIVE 5270	Environmental Protection and Management
CIVE 5271	Solid and Hazardous Waste Management
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure
CIVE 5280	Remote Sensing of the Environment
CIVE 5300	Environmental Engineering Laboratory
CIVE 5321	Geoenvironmental Engineering
CIVE 5536	Hydrologic Engineering
CIVE 6777	Climate Hazards and Resilient Cities Abroad
CIVE 6778	Climate Adaptation and Policy Abroad
CIVE 7261	Surface Water Quality Modeling

CIVE 7263	Groundwater Quality Modeling
CIVE 7272	Air Quality Management

OTHER ELECTIVES LIST

Any required core course not used to meet the required core course requirement can be taken as another elective. Any restricted elective not used to meet the restricted elective requirement can be taken as another elective.

EECE 5626	Image Processing and Pattern Recognition
EECE 7204	Applied Probability and Stochastic Processes
ENVR 5190	Soil Science
ENVR 5250	Geology and Land-Use Planning
ENVR 5260	Geographical Information Systems
EEMB 5516	Oceanography
IE 6200	Engineering Probability and Statistics
IE 7280	Statistical Methods in Engineering
IE 7290	Reliability Analysis and Risk Assessment
MATH 7241	Probability 1
MATH 7343	Applied Statistics
MATH 7344	Regression, ANOVA, and Design

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Sustainable Building Systems, MSSBS

Website (http://www.northeastern.edu/camd/architecture/academic-programs/master-science-sustainable-building-systems)

Sara Wadia-Fascetti, PhD
Associate Dean for Graduate Education, Graduate School of Engineering

130 Snell Engineering Center
617.373.2711

mssusbuild@coe.neu.edu

The sustainable building systems program focuses on the design and operation of buildings to provide a comfortable, healthy, and productive indoor environment with minimal energy and environmental impact. Students have an opportunity to develop leadership and decision-making skills to implement sustainable building practices in either the private or public sectors in the global market.

The graduates of the **Master of Science in Sustainable Building Systems** program should display a high level of engineering knowledge in a broad range of architectural engineering, civil engineering, and construction management while embracing the concepts of engineering sustainability as related to energy and materials usage and the effects on the environment. Graduates will have the base training necessary to lead efforts within companies to plan and implement sustainable practices for the design and operation of buildings, realize energy and materials efficiency improvements, and minimize environmental impact. Upon graduation, students will have a theoretical background to the concepts behind the LEED (Leadership in Energy and Environmental Design) Green Associate examination.

Master's Degree in Sustainable Building Systems

Sample Curriculum

Below is a typical course sequence for graduation in two semesters.

The program is flexible to accommodate full-time students—who wish to proceed over a period of two to four semesters—and part-time students—who can complete the program requirements by taking one to two courses per semester, finishing the program in approximately four years.

Degree Requirements	Full-Time Study	Part-Time Study
Core courses	12	12
Restricted electives	8	8
Open elective	12	12

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Sustainable Building Systems with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Sustainable Building Systems in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved sustainable building systems technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

ARCH 5210 and ARCH 5211	Environmental Systems and Recitation for ARCH 5210	4
SBSY 5100	Sustainable Design and Technologies in Construction	4
SBSY 5200	Sustainable Engineering Systems for Buildings	4

Electives

RESTRICTED ELECTIVE LIST

Complete 8 semester hours from the following: 8

ARCH 5220	Integrated Building Systems
CIVE 5221	Construction Project Control and Organization
CIVE 5231	Alternative Project Delivery Systems in Construction
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure
CIVE 7220	Construction Management
or EMGT 5220	Engineering Project Management
CIVE 7230	Legal Aspects of Civil Engineering

EMGT 6305	Financial Management for Engineers
SBSY 5300	Information Systems for Integrated Project Delivery

OTHER ELECTIVE LIST

Any restricted elective not used to meet the restricted elective requirement can be taken as another elective.

Complete 12 semester hours from the following:		12
ACCT 6200	Financial Reporting and Managerial Decision Making 1	
ACCT 6201	Financial Reporting and Managerial Decision Making 2	
CIVE 5270	Environmental Protection and Management	
CIVE 7350	Behavior of Concrete Structures	
CIVE 7351	Behavior of Steel Structures	
FINA 6200	Value Creation through Financial Decision Making	
FINA 6216	Valuation and Value Creation	
FINA 6217	Real Estate Finance and Investment	
LPSC 7312	Cities, Sustainability, and Climate Change	
ME 5645	Environmental Issues in Manufacturing and Product Use	

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Electrical and Computer Engineering

Website (http://www.ece.neu.edu)

Miriam Leeser, PhD, Professor and Interim Chair

Waleed Meleis, PhD, Associate Professor and Associate Chair

409 Dana Research Center
617.373.7529
617.373.4431 (fax)
Jesse Marsh, Student Services Coordinator, ece-studentservices@ece.neu.edu

The Department of Electrical and Computer Engineering (ECE) offers the following graduate degree programs:

- Master of Science in Electrical and Computer Engineering (MSECE)
- Master of Science in Electrical and Computer Engineering Leadership (MSECEL)
- Doctor of Philosophy in Computer Engineering (PhD)
- Doctor of Philosophy in Electrical Engineering (PhD)

All degrees can be pursued on either a full- or part-time basis consistent with residency requirements for the PhD degrees. The master's curriculum includes areas of concentration in the following:

1. Communications, Control, and Signal Processing (CCSP)
2. Computer Networks and Security (CNWS)
3. Computer Systems and Software (CSYS)
4. Computer Vision, Machine Learning, and Algorithms (CVLA)
5. Electromagnetics, Plasma, and Optics (ELPO)
6. Microsystems, Materials, and Devices (MSMD)
7. Power Systems (POWR)

MSECE students pursue their degree by selecting one of the two tracks —MSECE with thesis and course track (MST) or MSECE course-only track (MSC). Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Full- and part-time students should follow the same curriculum requirements.

Master of Science Degree Requirements

Students must complete a minimum of 32 semester hours of approved course work with a minimum GPA of 3.000. MST track students must complete an 8-semester-hour thesis as part of their program of study.

Students who select the MST track must form a thesis committee comprised of at least three members. The thesis committee must include the thesis advisor, and at least two members must be tenured or tenure-track ECE faculty. The student shall present the thesis to this committee and to the ECE department at-large in the form of a seminar before final approval of the thesis.

The ECE department requires the master's degree students who hold research assistantships to register full-time.

COURSE REQUIREMENTS FOR MSC STUDENTS

The program requires 32 semester hours of graduate-level courses. At least five of these courses must be from the list of "depth" courses in the student's concentration and at least two must be outside this list; these courses are known as "breadth" courses. None of these courses can be from the list of "excluded courses." For students in the computer-engineering-related concentrations— computer systems and software; computer networks and security; and computer vision, machine learning, and algorithms—at least 20 semester hours of the 32 required semester hours must be graduate-level ECE courses. For other concentrations, at least 24 semester hours of the 32 required semester hours must be graduate-level ECE courses. More details on MSC requirements can be found in the Graduate Program Guide (http://www.ece.neu.edu/sites/default/files/pdfs/ece/ecegraduateprogramguide-fall_2016.pdf).

COURSE REQUIREMENTS FOR MST STUDENTS

The program requires 24 semester hours of graduate-level courses. At least three of these courses must be from the list of "depth" courses in the student's concentration and at least one must be outside this list; these courses are known as "breadth" courses. None of these courses can be from the list of "excluded courses." At least 12 semester hours of the required 24 semester hours must be graduate-level ECE courses. In addition, the program requires 8 semester hours of Thesis (EECE 7990). More details on MST requirements can be found in the Graduate Program Guide (http://www.ece.neu.edu/sites/default/files/pdfs/ece/ecegraduateprogramguide-fall_2016.pdf).

Graduate Certificate Options

Students enrolled in a master's degree in electrical and computer engineering have the opportunity to also pursue one of the many engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Master of Science in Electrical and Computer Engineering Leadership (MSECEL) (p. 167) along with the Graduate Certificate in Engineering Leadership.

In addition, students have the opportunity to pursue the Gordon Engineering Leadership Program (p. 204) in combination with the Master of Science in Electrical and Computer Engineering. This option results in an increase in total hours beyond that required for the master's degree only.

Electrical and Computer Engineering PhD Course Requirements

The student and his or her dissertation committee determine the program of study. A typical program comprises 24 semester hours of course work beyond the Master of Science degree. Students who enter the program with a bachelor's degree complete the curriculum for a Master of Science degree with an area of concentration. After that, as a minimum, the PhD program must include at least 16 semester hours of graduate course work beyond the Master of Science degree, at least 8 semester hours of which must be graduate-level ECE courses. Students who enter the program with a relevant and approved Master of Science degree complete a minimum of 16 semester hours of graduate course work, at least 8 semester hours of which must be graduate-level ECE courses. All students must achieve a minimum cumulative GPA of 3.000.

Programs

Doctor of Philosophy (PhD)

- Computer Engineering (p. 143)
- Computer Engineering—Advanced Entry (p. 144)
- Electrical Engineering (p. 145)
- Electrical Engineering—Advanced Entry (p. 146)

Master of Science (MS)

- Applied Physics and Engineering (p. 147)
- Data Science (p. 90)

Master of Science in Electrical and Computer Engineering (MSECE)

- Concentration in Communications, Control, and Signal Processing (p. 150)
- Concentration in Computer Systems and Software (p. 152)
- Concentration in Computer Networks and Security (p. 155)
- Concentration in Computer Vision, Machine Learning, and Algorithms (p. 157)
- Concentration in Electromagnetics, Plasma, and Optics (p. 160)
- Concentration in Microsystems, Materials, and Devices (p. 162)
- Concentration in Power Systems (p. 165)

Master of Science in Electrical and Computer Engineering Leadership (MSECEL)

- Electrical and Computer Engineering Leadership (p. 167)

Computer Engineering, PhD

The Doctor of Philosophy in Computer Engineering offers students an opportunity for study in a broad range of areas in computer engineering. Details on PhD requirements can be found in the Graduate Program Guide (http://www.ece.neu.edu/sites/default/files/pdfs/ece/ecegraduateprogramguide-fall_2016.pdf). A summary of requirements is given below.

Qualifying Exam and Degree Candidacy

The PhD qualifying exam is the examination for admissions to the doctoral programs in electrical engineering and in computer engineering. It is a written exam in the student's major area, and some concentrations include an oral exam. The exam has the dual purposes of serving as an indicator of the student's capability for successful completion of the PhD in electrical engineering or in computer engineering and of serving as a guide to the student's advisor in developing a suitable plan of study, tailored to the individual needs of the student. Students are tested on graduate course material as specified by the faculty in the chosen area.

A student who has matriculated in the PhD program is considered a predoctoral student. Upon successful completion of the qualifying exam, the student is designated a PhD candidate. All predoctoral students who hold a master's degree or its equivalent and who matriculate in a fall semester must take this exam in the spring semester of their first academic year of study. A student who fails the qualifying exam will be permitted to retake the exam only one more time.

Residence Requirement

After reaching PhD candidacy, one year of full-time graduate work or two consecutive years of part-time graduate work satisfy the university residence requirement. In the latter case, the student's advisor must approve a detailed schedule in order to ensure that the student devotes at least half of the time to the requirements of the Graduate School of Engineering.

Dissertation

Within one year of passing the PhD qualifying exam, the PhD candidate must form a dissertation committee. A dissertation committee must have at least three members. At least two of the committee members must be tenured or tenure-track Department of Electrical and Computer Engineering (ECE) faculty, and the committee must include the student's advisor. The chair of the committee must be a tenured or tenure-track faculty member in the ECE department.

The dissertation committee must design an appropriate program of study that prepares the student to be a successful doctoral-level engineer as well as direct the candidate's dissertation research. The dissertation committee will approve the dissertation in final form.

DISSERTATION AND DISSERTATION CONTINUATION REGISTRATION

Upon successful completion of the PhD qualifying exam and the required course work, the PhD candidate must register in two consecutive semesters for Dissertation (EECE 9990) . Upon completion of this sequence, the student must register for Dissertation Continuation (EECE 9996) in every semester until the dissertation is completed. A student may not register for Continuation until he or she fulfills the two-semester sequence of Dissertation.

REGISTRATION REQUIREMENTS FOR PREDOCTORAL AND PHD CANDIDATE GRADUATE ASSISTANTS

The ECE department requires that predoctoral students and PhD candidates who hold research or teaching assistantships be registered full-time. Predoctoral PhD students may register for Research (EECE 9986) (zero credit, full-time equivalent) *if needed* to fulfill the registration requirement.

PHD PROPOSAL REVIEW

Each PhD candidate must demonstrate, by means of the proposal review, subject matter knowledge satisfactory for the award of the degree.

The proposal review is an oral presentation followed by a question-and-answer session administered by the student's dissertation advisor/committee. The proposal review will be given at the time the student submits his or her dissertation proposal to the dissertation advisor/committee for approval. As part of this exam, the dissertation advisor/committee will review the student's doctoral program and his or her

performance in graduate courses, as well as examine the student on subject matter related to his or her graduate course work and dissertation subject area.

FINAL DISSERTATION DEFENSE

The final dissertation defense will include the subject matter of the dissertation and significant developments in the field of the dissertation work. Other related fields may be included if recommended by the examining faculty. The dissertation defense must be scheduled at least six months after the PhD proposal review.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual departmental review (each fall semester after you are in the program for at least one year)
Qualifying examination
Dissertation committee
Proposal stage review
Dissertation defense

General Requirements

Complete 32 semester hours of approved course work—equivalent of MSECE degree. Then complete 16 semester hours, of which 8 must be graduate-level EECE courses. Consult faculty research advisor for acceptable courses.

Dissertation

Complete the following (repeatable) course twice:

EECE 9990	Dissertation

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.000 GPA required

Computer Engineering, PhD—Advanced Entry

The PhD program in computer engineering offers students an opportunity for study in a broad range of areas in computer engineering. Details on PhD requirements can be found in the Graduate Program Guide (http://www.ece.neu.edu/sites/default/files/pdfs/ece/ecegraduateprogramguide-fall_2016.pdf). A summary of requirements is given below.

Qualifying Exam and Degree Candidacy

The PhD qualifying exam is the examination for admissions to the doctoral programs in electrical engineering and in computer engineering. It is a written exam in the student's major area, and some concentrations include an oral exam. The exam has the dual purposes of serving as an indicator of the student's capability for successful completion of the PhD in electrical engineering or in computer engineering and of serving as a guide to the student's advisor in developing a suitable plan of study, tailored to the individual needs of the student. Students are tested on graduate course material as specified by the faculty in the chosen area.

A student who has matriculated in the PhD program is considered a predoctoral student. Upon successful completion of the qualifying exam, the student is designated a PhD candidate. All predoctoral students who hold a master's degree or its equivalent and who matriculate in a fall semester must take this exam in the spring semester of their first academic year of study. A student who fails the qualifying exam will be permitted to retake the exam only one more time.

Residence Requirement

After reaching PhD candidacy, one year of full-time graduate work or two consecutive years of part-time graduate work satisfy the university residence requirement. In the latter case, the student's advisor must approve a detailed schedule in order to ensure that the student devotes at least half of the time to the requirements of the Graduate School of Engineering.

Dissertation

Within one year of passing the PhD qualifying exam, the PhD candidate must form a dissertation committee. A dissertation committee must have at least three members. At least two of the committee members must be tenured or tenure-track Department of Electrical and Computer Engineering (ECE) faculty and the committee must include the student's advisor. The chair of the committee must be a tenured or tenure-track faculty member in the ECE department.

The dissertation committee must design an appropriate program of study that prepares the student to be a successful doctoral-level engineer as well as direct the candidate's dissertation research. The dissertation committee will approve the dissertation in final form.

Dissertation and Dissertation Continuation Registration

Upon successful completion of the PhD qualifying exam and the required course work, the PhD candidate must register in two consecutive semesters for Dissertation (EECE 9990) . Upon completion of this sequence, the student must register for Dissertation Continuation (EECE 9996) in every semester until the dissertation is completed.. A student may not register for Continuation until he or she fulfills the two-semester sequence of Dissertation.

Registration Requirements for Predoctoral and PhD Candidate Graduate Assistants

The ECE department requires that predoctoral students and PhD candidates who hold research or teaching assistantships be registered full-time. Predoctoral PhD students may register for Research (EECE 9986) (zero credit, full-time equivalent) *if needed* to fulfill the registration requirement.

PhD Proposal Review

Each PhD candidate must demonstrate, by means of the proposal review, subject matter knowledge satisfactory for the award of the degree.

The proposal review is an oral presentation followed by a question-and-answer session administered by the student's dissertation advisor/committee. The proposal review will be given at the time the student submits his or her dissertation proposal to the dissertation advisor/committee for approval. As part of this exam, the dissertation advisor/committee will review the student's doctoral program and his or her performance in graduate courses, as well as examine the student on subject matter related to his or her graduate course work and dissertation subject area.

Final Dissertation Defense

The final dissertation defense will include the subject matter of the dissertation and significant developments in the field of the dissertation work. Other related fields may be included if recommended by the examining faculty. The dissertation defense must be scheduled at least six months after the PhD proposal review.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review (each fall semester after you are in the program for at least one year)
Qualifying examination
Dissertation committee
Proposal stage review
Dissertation defense

General Requirements

Complete 16 semester hours of approved course work. At least 8 semester hours must be graduate-level EECE courses. Consult your faculty advisor for acceptable courses.

Dissertation

Complete the following (repeatable) course twice:

EECE 9990	Dissertation

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Electrical Engineering, PhD

The PhD program in electrical engineering offers students an opportunity for study in a broad range of areas in electrical engineering. Details on PhD requirements can be found in the Graduate Program Guide (http://www.ece.neu.edu/sites/default/files/pdfs/ece/ecegraduateprogramguide-fall_2016.pdf). A summary of requirements is given below.

Qualifying Exam and Degree Candidacy

The PhD qualifying exam is the examination for admissions to the doctoral programs in electrical engineering and in computer engineering. It is a written exam in the student's major area, and some concentrations include an oral exam. The exam has the dual purposes of serving as an indicator of the student's capability for successful completion of the PhD in electrical engineering or in computer engineering and of serving as a guide to the student's advisor in developing a suitable plan of study, tailored to the individual needs of the student. Students are tested on graduate course material as specified by the faculty in the chosen area.

A student who has matriculated in the PhD program is considered a predoctoral student. Upon successful completion of the qualifying exam, the student is designated a PhD candidate. All predoctoral students who hold a master's degree or its equivalent and who matriculate in a fall semester must take this exam in the spring semester of their first academic year of study. A student who fails the qualifying exam will be permitted to retake the exam only one more time.

Residence Requirement

After reaching PhD candidacy, one year of full-time graduate work or two consecutive years of part-time graduate work satisfy the university residence requirement. In the latter case, the student's advisor must approve a detailed schedule in order to ensure that the student devotes at least half of the time to the requirements of the Graduate School of Engineering.

Dissertation

Within one year of passing the PhD qualifying exam, the PhD candidate must form a dissertation committee. A dissertation committee must have at least three members. At least two of the committee members must be tenured or tenure-track Department of Electrical and Computer Engineering (ECE) faculty and the committee must include the student's advisor. The chair of the committee must be a tenured or tenure-track faculty member in the ECE department.

The dissertation committee must design an appropriate program of study that prepares the student to be a successful doctoral-level engineer as well as direct the candidate's dissertation research. The dissertation committee will approve the dissertation in final form.

Dissertation and Dissertation Continuation Registration

Upon successful completion of the PhD qualifying exam and the required course work, the PhD candidate must register in two consecutive semesters for Dissertation (EECE 9990). Upon completion of this sequence, the student must register for Dissertation (EECE 9990) in every semester until the dissertation is completed. A student may not register for Continuation until he or she fulfills the two-semester sequence of Dissertation.

Registration Requirements for Predoctoral and PhD Candidate Graduate Assistants

The ECE department requires that predoctoral students and PhD candidates who hold research or teaching assistantships be registered full-time. Predoctoral PhD students may register for Research (EECE 9986) (zero credit, full-time equivalent) *if needed* to fulfill the registration requirement.

PhD Proposal Review

Each PhD candidate must demonstrate, by means of the proposal review, subject matter knowledge satisfactory for the award of the degree.

The proposal review is an oral presentation followed by a question-and-answer session administered by the student's dissertation advisor/committee. The proposal review will be given at the time the student submits his or her dissertation proposal to the dissertation advisor/committee for approval. As part of this exam, the dissertation advisor/committee will review the student's doctoral program and his or her performance in graduate courses, as well as examine the student on subject matter related to his or her graduate course work and dissertation subject area.

Final Dissertation Defense

The final dissertation defense will include the subject matter of the dissertation and significant developments in the field of the dissertation work. Other related fields may be included if recommended by the examining faculty. The dissertation defense must be scheduled at least six months after the PhD proposal review.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review (each fall semester after you are in the program for at least one year)
Qualifying examination
Dissertation committee
Proposal stage review
Dissertation defense

General Requirements

Complete 32 semester hours of approved course work—equivalent of MSECE degree. Then complete 16 semester hours, of which 8 must be graduate-level EECE courses. Consult your faculty research advisor for acceptable courses.

Dissertation

Complete the following (repeatable) course twice:

EECE 9990	Dissertation

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.000 GPA required

Electrical Engineering, PhD—Advanced Entry

The PhD program in electrical engineering offers students the opportunity for study in a broad range of areas in electrical engineering. Details on PhD requirements can be found in the Graduate Program Guide (http://www.ece.neu.edu/sites/default/files/pdfs/ece/ecegraduateprogramguide-fall_2016.pdf). A summary of requirements is given below.

Qualifying Exam and Degree Candidacy

The PhD qualifying exam is the examination for admissions to the doctoral programs in electrical engineering and in computer engineering. It is a written exam in the student's major area, and some concentrations include an oral exam. The exam has the dual purposes of serving as an indicator of the student's capability for successful completion of the PhD in electrical engineering or in computer engineering and of serving as a guide to the student's advisor in developing a suitable plan of study, tailored to the individual needs of the student. Students are tested on graduate course material as specified by the faculty in the chosen area.

A student who has matriculated in the PhD program is considered a predoctoral student. Upon successful completion of the qualifying exam, the student is designated a PhD candidate. All predoctoral students who hold a master's degree or its equivalent and who matriculate in a fall semester must take this exam in the spring semester of their first academic year of study. A student who fails the qualifying exam will be permitted to retake the exam only one more time.

Residence Requirement

After reaching PhD candidacy, one year of full-time graduate work or two consecutive years of part-time graduate work satisfy the university residence requirement. In the latter case, the student's advisor must approve a detailed schedule in order to ensure that the student devotes at least half of the time to the requirements of the Graduate School of Engineering.

Dissertation

Within one year of passing the PhD qualifying exam, the PhD candidate must form a dissertation committee. A dissertation committee must have at least three members. At least two of the committee members must be tenured or tenure-track Department of Electrical and Computer Engineering (ECE) faculty and the committee must include the student's advisor. The chair of the committee must be a tenured or tenure-track faculty member in the ECE department.

The dissertation committee must design an appropriate program of study that prepares the student to be a successful doctoral-level engineer as well as direct the candidate's dissertation research. The dissertation committee will approve the dissertation in final form.

Dissertation and Dissertation Continuation Registration

Upon successful completion of the PhD qualifying exam and the required course work, the PhD candidate must register in two consecutive semesters for Dissertation (EECE 9990). Upon completion of this sequence, the student must register for Dissertation Continuation (EECE 9996) in every semester until the dissertation is completed. A student may not register for Continuation until he or she fulfills the two-semester sequence of Dissertation.

Registration Requirements for Predoctoral and PhD Candidate Graduate Assistants

The ECE department requires that predoctoral students and PhD candidates who hold research or teaching assistantships be registered full-time. Predoctoral PhD students may register for Research (EECE 9986) (zero credit, full-time equivalent) *if needed* to fulfill the registration requirement.

PhD Proposal Review

Each PhD candidate must demonstrate, by means of the proposal review, subject matter knowledge satisfactory for the award of the degree.

The proposal review is an oral presentation followed by a question-and-answer session administered by the student's dissertation advisor/committee. The proposal review will be given at the time the student submits his or her dissertation proposal to the dissertation advisor/committee for approval. As part of this exam, the dissertation advisor/committee will review the student's doctoral program and his or her performance in graduate courses, as well as examine the student on subject matter related to his or her graduate course work and dissertation subject area.

Final Dissertation Defense

The final dissertation defense will include the subject matter of the dissertation and significant developments in the field of the dissertation work. Other related fields may be included if recommended by the examining faculty. The dissertation defense must be scheduled at least six months after the PhD proposal review.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review (each fall semester after you are in the program for at least one year)
Qualifying examination
Dissertation committee
Proposal stage review
Dissertation defense

General Requirements

Complete 16 semester hours of approved course work. At least 8 semester hours must be graduate-level EECE courses. Consult your faculty advisor for acceptable courses.

Dissertation

Complete the following (repeatable) course twice:

EECE 9990	Dissertation

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Applied Physics and Engineering, MS

The combined MS program in applied physics and engineering allows graduate students to receive training in one of three concentrations of the electrical and computer engineering department while also receiving fundamental graduate-level physics training that is relevant to that area.

Thesis Option

A student may complete an additional 8 semester hours of thesis. Students may register for an additional two semesters of thesis work, Thesis (EECE 7990) (4 semester hours) or Thesis (PHYS 7990) (4 semester hours), depending on the affiliation of the thesis advisor. A thesis committee is composed of an advisor and two faculty members from physics or electrical engineering.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Concentrations

Complete one of the following concentrations:

- Microsystems, Materials, and Devices (p. 147)
- Electromagnetics, Plasma, and Optics (p. 147)
- Analysis, Modeling, and Computation (p. 147)

MICROSYSTEMS, MATERIALS, AND DEVICES

Core Courses

EECE 7201	Solid State Devices	4
PHYS 7324	Condensed Matter Physics	4
Engineering Course Work		
Complete 12 semester hours from the following:		12
EECE 5606	Micro- and Nanofabrication	
EECE 5680	Electric Drives	
EECE 5696	Energy Harvesting Systems	
EECE 7204	Applied Probability and Stochastic Processes	
EECE 7240	Analog Integrated Circuit Design	
EECE 7241	Advanced Solid State Devices	
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication	
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)	
EECE 7245	Microwave Circuit Design for Wireless Communication	
EECE 7246	Design and Analysis of Digital Integrated Circuits	
EECE 7247	Radio Frequency Integrated Circuit Design	
EECE 7353	VLSI Design	
EECE 7354	VLSI Architecture	
EECE 7269	Special Topics in Electronics, Semiconductor Devices, and Microfabrication	
EECE 7276	Microwave Properties of Materials	
EECE 7284	Optical Properties of Matter	
EECE 7285	Opto-electronics and Fiber Optics	
EECE 7398	Special Topics	
Physics Course Work		
Complete 12 semester hours from the following:		12
PHYS 5114	Physics of Advanced Materials	
PHYS 5318	Principles of Experimental Physics	
PHYS 7301	Classical Mechanics/Math Methods	
PHYS 7302	Electromagnetic Theory	
PHYS 7305	Statistical Physics	
PHYS 7315	Quantum Theory 1	
PHYS 7316	Quantum Theory 2	
PHYS 7321	Computational Physics	
PHYS 7331	Network Science Data	
PHYS 7734	Topics: Condensed Matter Physics	

ELECTROMAGNETICS, PLASMA, AND OPTICS

Core Courses

EECE 7203	Complex Variable Theory and Differential Equations	4
PHYS 7302	Electromagnetic Theory	4
Engineering Course Work		
Complete 12 semester hours from the following:		12
EECE 5648	Biomedical Optics	
EECE 5698	Special Topics in Electrical and Computer Engineering (Subsurface Imaging)	
EECE 7105	Optics for Engineers	
EECE 7202	Electromagnetic Theory 1	
EECE 7245	Microwave Circuit Design for Wireless Communication	
EECE 7270	Electromagnetic Theory 2	
EECE 7271	Computational Methods in Electromagnetics	
EECE 7274	Propagation in Artificial Structures	
EECE 7275	Antennas and Radiation	
EECE 7276	Microwave Properties of Materials	
EECE 7284	Optical Properties of Matter	
EECE 7285	Opto-electronics and Fiber Optics	
EECE 7287	Optical Detection	
EECE 7293	Modern Imaging	
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics	
Physics Course Work		
Complete 12 semester hours from the following:		12
PHYS 5318	Principles of Experimental Physics	
PHYS 7305	Statistical Physics	
PHYS 7315	Quantum Theory 1	
PHYS 7316	Quantum Theory 2	
PHYS 7321	Computational Physics	
PHYS 7324	Condensed Matter Physics	
PHYS 7731	Biological Physics 1	

ANALYSIS, MODELING, AND COMPUTATION

Core Courses

EECE 7205	Fundamentals of Computer Engineering	4
PHYS 7321	Computational Physics	4
Engineering Course Work		
Complete 12 semester hours from the following:		12
EECE 5626	Image Processing and Pattern Recognition	
EECE 5639	Computer Vision	
EECE 5640	High-Performance Computing	
EECE 5642	Data Visualization	
EECE 5643	Simulation and Performance Evaluation	
EECE 5644	Introduction to Machine Learning and Pattern Recognition	
EECE 7205	Fundamentals of Computer Engineering	
EECE 7271	Computational Methods in Electromagnetics	
EECE 7313	Pattern Recognition	
EECE 7352	Computer Architecture	
EECE 7353	VLSI Design	
EECE 7354	VLSI Architecture	
EECE 7358	Parallel Architecture for High-Performance Computing	
EECE 7360	Combinatorial Optimization	
EECE 7374	Fundamentals of Computer Networks	
EECE 7376	Operating Systems: Interface and Implementation	
Physics Course Work		
Complete 12 semester hours from the following:		12
PHYS 5116	Complex Networks and Applications	
PHYS 5318	Principles of Experimental Physics	
PHYS 7301	Classical Mechanics/Math Methods	
PHYS 7305	Statistical Physics	
PHYS 7331	Network Science Data	
PHYS 7335	Dynamical Processes in Complex Networks	

Thesis Option

Students may register for an additional two semesters of thesis work, Thesis (EECE 7990) or Thesis (PHYS 7990) , depending on the affiliation of the thesis advisor. Thesis credits cannot be substituted for any of the course work listed above. This option requires a total of 40 semester hours for the master's degree.

Program Credit/GPA Requirements

32–40 total semester hours required
Minimum 3.000 GPA required

Data Science, MS

The College of Computer and Information Science (CCIS) and the Department of Electrical and Computer Engineering (ECE) jointly offer a new interdisciplinary Master of Science program in data science. This program is designed to give students a comprehensive framework for processing, modeling, analyzing, and reasoning about data. Students will engage in an extensive core intended to develop depth in computational modeling, data collection and integration, data storage and retrieval, data processing, modeling and analytics, and visualization. Students will also be given a variety of elective areas in CCIS, the College of Engineering (COE), and throughout the campus to explore key contextual areas or more complex technical applications. Successful program graduates will be well positioned to attain data scientist and data engineer positions in a fast-growing field or to progress into doctoral degrees in related disciplines.

The Master of Science in Data Science is comprised of eight courses; five core courses and three electives. The core courses are designed and developed by the CCIS and ECE faculty. Elective courses consist of graduate courses offered in CCIS, COE, and other partner colleges.

Course Requirements

The Master of Science in Data Science curriculum requires five core courses that represent the essential mathematical/statistical and technical knowledge for deep data analysis. These courses examine foundational programming concepts and languages, integration, collection, storage, retrieval, large-scale computing, mathematical concepts in statistics, linear algebra, and optimization, as well as visual and computational analysis, machine learning, and visualization. The courses are tailored toward technically or mathematically trained students.

The five core courses include:

- Two core courses in algorithms and data processing
- Two core courses in machine learning and data mining
- One core course in information visualization

Three elective courses are drawn from a selection of courses across Northeastern.

Learning Outcomes

Students who complete the MS degree will be able to:

- Collect data from numerous sources (databases, files, XML, JSON, CSV, and Web APIs) and integrate them into a form in which the data is fit for analysis
- Use R and Python to explore data, produce summary statistics, perform statistical analyses; use standard data mining and machine-learning models for effective analysis
- Select, plan, and implement storage, search, and retrieval components of large-scale structure and unstructured repositories
- Retrieve data for analysis, which requires knowledge of standard retrieval mechanisms such as SQL and XPath, but also retrieval of unstructured information such as text, image, and a variety of alternate formats
- Match the methodological principles and limitations of machine learning and data mining methods to specific applied problems and communicate the applicability and the advantages/disadvantages of the methods in the specific problem to nondata experts
- Carry out the full data analysis workflow, including unsupervised class discovery, supervised class comparison, and supervised class prediction; Summarize, interpret, and communicate the analysis of results
- Organize visualization of data for analysis, understanding, and communication; choose appropriate visualization method for a given data type using effective design and human perception principle
- Develop methods for modeling, analyzing, and reasoning about data arising in one or more application domains such as social science, health informatics, web and social media, climate informatics, urban informatics, geographical information systems, business analytics, bioinformatics, complex networks, public health, and game design

- Manage, process, analyze, and visualize data at scale. This outcome allows students to handle data where the conventional information technology fail.

Placement Exams

Each incoming masters student, regardless of his or her background, takes two placement exams administered one week prior to the beginning of the semester. The two exams cover fundamentals of computer science and programming skills and basic statistics, probability, and linear algebra. If the student does not get a B or above in a part of the placement exam, then the student must take the corresponding introductory course.

- Introduction to Programming for Data Science (DS 5010) The introductory course on fundamentals of programming and data structures covers data structures (lists, arrays, trees, hash tables, etc.), program design, programming practices, testing, debugging, maintainability, data collection techniques, and data cleaning and preprocessing. This course will have a class project where the students will use the concepts they learn to collect data from the web, clean, and preprocess and ready for analysis.
- Introduction to Linear Algebra and Probability for Data Science (DS 5020) The introductory course on basics of statistics, probability, and linear algebra covers random variables, frequency distributions, measures of central tendency, measures of dispersion, moments of a distribution, discrete and continuous probability distributions, chain rule, Bayes' rule, correlation theory, basic sampling, matrix operations, trace of a matrix, norms, linear independence and ranks, inverse of a matrix, orthogonal matrices, range and null space of a matrix, the determinant of a matrix, positive semidefinite matrices, eigenvalues and eigenvectors.

Program Requirements

Required Course Work

A grade of B or higher is required in the following courses:

Algorithms		
Complete 4 semester hours from the following:		4
CS 5800	Algorithms	
EECE 7205	Fundamentals of Computer Engineering	
Data Management and Processing		
DS 5110	Introduction to Data Management and Processing	4
Machine Learning and Data Mining		
DS 5220	Supervised Machine Learning and Learning Theory	4
DS 5230	Unsupervised Machine Learning and Data Mining	4
Presentation and Visualization		
DS 5500		

Electives

Complete 12 semester hours from the following:		12
College of Computer and Information Science		
CS 6200	Information Retrieval	
CS 5100	Foundations of Artificial Intelligence	
CS 6120	Natural Language Processing	
CS 5750	Social Computing	
CS 6350	Empirical Research Methods	
CS 7180	Special Topics in Artificial Intelligence	
CS 7280	Special Topics in Database Management	
College of Engineering		
CIVE 7388	Special Topics in Civil Engineering	
EECE 5639	Computer Vision	
EECE 5640	High-Performance Computing	
EECE 7335	Detection and Estimation Theory	
EECE 7337	Information Theory	
EECE 7360	Combinatorial Optimization	
EECE 7370	Advanced Computer Vision	
EECE 7397	Advanced Machine Learning	
IE 5640	Data Mining for Engineering Applications	
IE 7275	Data Mining in Engineering	
IE 7280	Statistical Methods in Engineering	
College of Social Sciences and Humanities		
PPUA 5261	Dynamic Modeling for Environmental Decision Making	
PPUA 5262	Big Data for Cities	
PPUA 5263	Geographic Information Systems for Urban and Regional Policy	
PPUA 5266	Urban Theory and Science	
PPUA 7237	Advanced Spatial Analysis of Urban Systems	
POLS 7200	Perspectives on Social Science Inquiry	
POLS 7201	Research Design	
POLS 7202	Quantitative Techniques	
D'Amore-McKim School of Business		
BUSN 6320	Business Analytics Fundamentals	
BUSN 6324	Predictive Analytics for Managers	
BUSN 6326	Introduction to Big Data and Digital Marketing Analytics	
College of Science		
MATH 7340	Statistics for Bioinformatics	
PHYS 5116	Complex Networks and Applications	
PHYS 7305	Statistical Physics	
PHYS 7321	Computational Physics	
PHYS 7331	Network Science Data	
Bouvé College of Health Sciences		
NRSG 5121	Epidemiology and Population Health	
PHTH 5202	Introduction to Epidemiology	
PHTH 5210	Biostatistics in Public Health	
PHTH 5224	Social Epidemiology	
College of Arts, Media and Design		
GSND 5110	Game Design and Analysis	
GSND 6350	Game Analytics	

Note: Students that take 3-credit-hour elective courses (i.e., Bouvé, CSSH courses) will register for an accompanying data science project course in the same semester ((DS 8982)). In order to earn this additional credit, students will be expected to work with faculty to design an additional project in line with the curricular aims of their chosen elective and the data science core learning outcomes.

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

Electrical and Computer Engineering with Concentration in Communications, Control, and Signal Processing, MSECE

The master's degree program in electrical and computer engineering offers in-depth course work within the concentration-choice-related areas. The curriculum is integrated and intensive and is built on state-of-the-art research, taught by faculty who are experts in their areas.

Excluded Courses for All MSECE Concentrations

You **cannot take excluded courses as part of your MSECE program**. Please *do not* petition to take these courses, as any petition to take these courses will be automatically rejected. Courses from the following subject areas may not count toward any concentration within the MSECE program: CSYE, ENSY, EMGT, INFO, SBSY, TELE. Select CS courses are also excluded from all MSECE concentrations. Please see the program requirements tab and your college administrator for more information.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Electrical and Computer Engineering with a Concentration in Communications, Control, and Signal Processing with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Electrical and Computer Engineering with a Concentration in Communications, Control, and Signal Processing in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 48-semester-hour degree and certificate will require 32 semester hours of advisor-approved communications, control, and signal processing technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Options

Complete one of the following options:

COURSE WORK OPTION

Depth Courses	
Complete 20 semester hours from the depth course list below. (p. 150)	20
Breadth Courses	
Complete 8 semester hours from the breadth course list below. (p. 151)	8
Note: Depth courses cannot be taken for breadth.	
Elective	
Complete 4 additional semester hours from either the depth or breadth course lists below.	4

THESIS OPTION

Thesis	
EECE 7990 Thesis	8
Depth Courses	
Complete 12 semester hours from the depth course list below. (p. 150)	12
Breadth Courses	
Complete 4 semester hours from the breadth course list below. (p. 151)	4
Note: Depth courses cannot be taken for breadth.	
Elective	
Complete 8 additional semester hours from either the depth or breadth course lists below.	8

Course Lists

DEPTH COURSES

EECE 5576	Wireless Communication Systems
EECE 5580	Classical Control Systems
EECE 5610	Digital Control Systems
EECE 5626	Image Processing and Pattern Recognition
EECE 5664	Biomedical Signal Processing
EECE 5666	Digital Signal Processing
EECE 5698	Special Topics in Electrical and Computer Engineering (Mobile Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Principles of Assistive Robotics)
EECE 7200	Linear Systems Analysis
EECE 7204	Applied Probability and Stochastic Processes
EECE 7211	Nonlinear Control
EECE 7213	System Identification and Adaptive Control
EECE 7214	Optimal and Robust Control
EECE 7310	Modern Signal Processing
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7312	Statistical and Adaptive Signal Processing
EECE 7323	Numerical Optimization Methods
EECE 7332	Error Correcting Codes
EECE 7335	Detection and Estimation Theory
EECE 7336	Digital Communications
EECE 7337	Information Theory
EECE 7263	Humanoid Robotics
EECE 7398	Special Topics (Probabilistic System Modeling and Analysis)
EECE 7398	Special Topics (Big Data and Sparsity in Control, Machine Learning, and Signal Processing)
EECE 7400	Special Problems in Electrical Engineering

BREADTH COURSES

EECE 5155	Wireless Sensor Networks and the Internet of Things
EECE 5161	Thin Film Technologies
EECE 5606	Micro- and Nanofabrication
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS
EECE 5639	Computer Vision
EECE 5640	High-Performance Computing
EECE 5642	Data Visualization
EECE 5643	Simulation and Performance Evaluation
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 5647	Nanophotonics
EECE 5648	Biomedical Optics
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology
EECE 5680	Electric Drives
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 5688	Analysis of Unbalanced Power Grids
EECE 5694	Electromagnetic Photonic Devices
EECE 5695	Radio-Frequency and Optical Antennas
EECE 5696	Energy Harvesting Systems
EECE 5697	Acoustics and Sensing
EECE 5698	Special Topics in Electrical and Computer Engineering (Networks: Technology, Economics, Social Interactions)
EECE 5698	Special Topics in Electrical and Computer Engineering (Software Security)
EECE 5698	Special Topics in Electrical and Computer Engineering (Advanced Network Management)
EECE 5698	Special Topics in Electrical and Computer Engineering (Robotics Sensing and Navigation)
EECE 5698	Special Topics in Electrical and Computer Engineering (Parallel Processing for Data Analytics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Introduction to Multiferroic Materials and Systems)
EECE 7105	Optics for Engineers
EECE 7201	Solid State Devices
EECE 7202	Electromagnetic Theory 1
EECE 7203	Complex Variable Theory and Differential Equations
EECE 7205	Fundamentals of Computer Engineering
EECE 7220	Power System Analysis 2
EECE 7221	Power System Operation and Control
EECE 7224	Power Systems State Estimation
EECE 7226	Modeling and Simulation of Power System Transients
EECE 7238	Special Topics in Electric Drives
EECE 7228	Advanced Power Electronics (Advanced Power Electronics)
EECE 7239	Special Topics in Power Systems
EECE 7240	Analog Integrated Circuit Design
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication
EECE 7243	Integrated Circuit Fabrication
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)
EECE 7245	Microwave Circuit Design for Wireless Communication
EECE 7246	Design and Analysis of Digital Integrated Circuits
EECE 7247	Radio Frequency Integrated Circuit Design
EECE 7250	Power Management Integrated Circuits
EECE 7258	(Human Centered Computing -- former Special Topics)
EECE 7270	Electromagnetic Theory 2
EECE 7271	Computational Methods in Electromagnetics
EECE 7275	Antennas and Radiation
EECE 7276	Microwave Properties of Materials
EECE 7284	Optical Properties of Matter
EECE 7285	Opto-electronics and Fiber Optics
EECE 7287	Optical Detection
EECE 7293	Modern Imaging
EECE 7295	Applied Magnetism
EECE 7296	Electronic Materials
EECE 7297	Advanced Magnetic Materials—Magnetic Devices
EECE 7298	Magnetic Materials—Fundamentals and Measurements
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics
EECE 7313	Pattern Recognition
EECE 7352	Computer Architecture
EECE 7353	VLSI Design
EECE 7357	Fault-Tolerant Computers
EECE 7360	Combinatorial Optimization
EECE 7364	Mobile and Wireless Networking
EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7370	Advanced Computer Vision
EECE 7374	Fundamentals of Computer Networks
EECE 7376	Operating Systems: Interface and Implementation
EECE 7390	Computer Hardware Security
EECE 7393	Analysis and Design of Data Networks
EECE 7397	Advanced Machine Learning
EECE 7398	Special Topics (Analysis and Design of Data Networks)
EECE 7398	Special Topics (Compilers)
EECE 7398	Special Topics (Advanced Computer Architecture)

EECE 7398	Special Topics (Advanced Topics in Scalable and Sustainable System Design)
EECE 7399	Preparing High-Stakes Written and Oral Materials
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory
CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5600	Computer Systems
CS 5770	Software Vulnerabilities and Security
CS 6110	Knowledge-Based Systems
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6310	Computational Imaging
CS 6410	Compilers
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6610	Parallel Computing
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6754	Secure Wireless Ad-hoc Robots on Mission (SWARM) 1
CS 6760	Privacy, Security, and Usability
CS 6810	Distributed Algorithms
CS 7785	Special Topics in Network Science
CS 7800	Advanced Algorithms

EXCLUDED COURSES FOR ALL MSECE CONCENTRATIONS

Please see your college administrator for more information.

Courses from the following subject areas may not count toward any concentration within the MSECE program:

CSYE, ENSY, EMGT, INFO, SBSY, TELE

The following CS courses may not count toward any concentration within the MSECE program:

CS 5010	Programming Design Paradigm
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5340	Computer/Human Interaction
CS 5520	Mobile Application Development
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking
CS 5800	Algorithms
CS 6350	Empirical Research Methods
CS 6710	Wireless Network

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Electrical and Computer Engineering with Concentration in Computer Systems and Software, MSECE

The master's degree programs in electrical and computer engineering offer in-depth course work within the concentration-choice-related areas. The curriculum is integrated and intensive and is built on groundbreaking research, taught by faculty who are experts in their areas.

Excluded Courses for All MSECE Concentrations

You **cannot take excluded courses as part of your MSECE program**. Please *do not* petition to take these courses, as any petition to take these courses will be automatically rejected. Courses from the following subject areas may not count toward any concentration within the MSECE program: CSYE, ENSY, EMGT, INFO, SBSY, TELE. Select CS courses are also excluded from all MSECE concentrations. Please see the program requirements tab and your college administrator for more information.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Electrical and Computer Engineering with a Concentration in Computer Systems and Software with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science degree in Electrical and Computer Engineering with a Concentration in Computer Systems and Software in addition to earning a Graduate Certificatein Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hourcurriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry based challenge project with multiple mentors. The integrated 48 semester hour degree and certificate will require 32 semester hours of advisor-approved computer systems and software technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Options

Complete one of the following options:

COURSE WORK OPTION

Depth Courses	
Complete 20 semester hours from the depth course list below. (p. 153)	20
Breadth Courses	
Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. (p. 153)	8
Note: Depth courses cannot be taken for breadth.	
Elective	
Complete 4 semester hours of either depth or breadth courses.	4

THESIS OPTION

Depth Courses	
Complete 12 semester hours from the depth course list below. (p. 153)	12
Breadth Courses	
Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. (p. 153)	8
Note: Depth courses cannot be taken for breadth.	
Elective	
Complete 4 additional semester hours from either depth or breadth courses.	4
Thesis	
EECE 7990 Thesis	8

Course Lists

DEPTH COURSES

EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS
EECE 5640	High-Performance Computing
EECE 5643	Simulation and Performance Evaluation
EECE 5698	Special Topics in Electrical and Computer Engineering (Principles of Assistive Robotics)
EECE 7205	Fundamentals of Computer Engineering
EECE 7352	Computer Architecture
EECE 7353	VLSI Design
EECE 7357	Fault-Tolerant Computers
EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7376	Operating Systems: Interface and Implementation
EECE 7390	Computer Hardware Security
EECE 7398	Special Topics (Compilers)
EECE 7398	Special Topics (Advanced Computer Architecture)
EECE 7398	Special Topics (Advanced Topics in Scalable and Sustainable System Design)
EECE 7400	Special Problems in Electrical Engineering
CS 5200	Database Management Systems
CS 5600	Computer Systems
CS 6410	Compilers
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6610	Parallel Computing
CS 6810	Distributed Algorithms

BREADTH COURSES

EECE 5155	Wireless Sensor Networks and the Internet of Things
EECE 5161	Thin Film Technologies
EECE 5576	Wireless Communication Systems
EECE 5580	Classical Control Systems
EECE 5606	Micro- and Nanofabrication
EECE 5610	Digital Control Systems
EECE 5626	Image Processing and Pattern Recognition
EECE 5639	Computer Vision
EECE 5642	Data Visualization
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 5647	Nanophotonics
EECE 5648	Biomedical Optics
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology
EECE 5664	Biomedical Signal Processing
EECE 5666	Digital Signal Processing
EECE 5680	Electric Drives
EECE 5682	Power Systems Analysis 1
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 5688	Analysis of Unbalanced Power Grids
EECE 5694	Electromagnetic Photonic Devices
EECE 5695	Radio-Frequency and Optical Antennas
EECE 5696	Energy Harvesting Systems
EECE 5697	Acoustics and Sensing
EECE 5698	Special Topics in Electrical and Computer Engineering (Mobile Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Networks: Technology, Economics, Social Interactions)
EECE 5698	Special Topics in Electrical and Computer Engineering (Software Security)
EECE 5698	Special Topics in Electrical and Computer Engineering (Advanced Network Management)
EECE 5698	Special Topics in Electrical and Computer Engineering (Mobile Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Robotics Sensing and Navigation)
EECE 5698	Special Topics in Electrical and Computer Engineering (Parallel Processing for Data Analytics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Introduction to Multiferroic Materials and Systems)
EECE 7105	Optics for Engineers
EECE 7200	Linear Systems Analysis
EECE 7201	Solid State Devices
EECE 7202	Electromagnetic Theory 1
EECE 7203	Complex Variable Theory and Differential Equations
EECE 7204	Applied Probability and Stochastic Processes
EECE 7211	Nonlinear Control

EECE 7213	System Identification and Adaptive Control
EECE 7214	Optimal and Robust Control
EECE 7220	Power System Analysis 2
EECE 7221	Power System Operation and Control
EECE 7224	Power Systems State Estimation
EECE 7226	Modeling and Simulation of Power System Transients
EECE 7228	Advanced Power Electronics
EECE 7238	Special Topics in Electric Drives
EECE 7239	Special Topics in Power Systems
EECE 7240	Analog Integrated Circuit Design
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication
EECE 7243	Integrated Circuit Fabrication
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)
EECE 7245	Microwave Circuit Design for Wireless Communication
EECE 7246	Design and Analysis of Digital Integrated Circuits
EECE 7247	Radio Frequency Integrated Circuit Design
EECE 7250	Power Management Integrated Circuits
EECE 7258	
EECE 7263	Humanoid Robotics
EECE 7270	Electromagnetic Theory 2
EECE 7271	Computational Methods in Electromagnetics
EECE 7275	Antennas and Radiation
EECE 7276	Microwave Properties of Materials
EECE 7284	Optical Properties of Matter
EECE 7285	Opto-electronics and Fiber Optics
EECE 7287	Optical Detection
EECE 7293	Modern Imaging
EECE 7295	Applied Magnetism
EECE 7296	Electronic Materials
EECE 7297	Advanced Magnetic Materials—Magnetic Devices
EECE 7298	Magnetic Materials—Fundamentals and Measurements
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics
EECE 7310	Modern Signal Processing
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7312	Statistical and Adaptive Signal Processing
EECE 7313	Pattern Recognition
EECE 7323	Numerical Optimization Methods
EECE 7332	Error Correcting Codes
EECE 7335	Detection and Estimation Theory
EECE 7336	Digital Communications
EECE 7337	Information Theory
EECE 7360	Combinatorial Optimization
EECE 7364	Mobile and Wireless Networking
EECE 7370	Advanced Computer Vision
EECE 7374	Fundamentals of Computer Networks
EECE 7393	Analysis and Design of Data Networks
EECE 7397	Advanced Machine Learning
EECE 7398	Special Topics (Probabilistic System Modeling and Analysis)
EECE 7398	Special Topics (Big Data and Sparsity in Control, Machine Learning, and Signal Processing)
EECE 7399	Preparing High-Stakes Written and Oral Materials
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
MATH 7233	Graph Theory
MATH 7232	Combinatorial Analysis
CS 5100	Foundations of Artificial Intelligence
CS 5770	Software Vulnerabilities and Security
CS 6110	Knowledge-Based Systems
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6310	Computational Imaging
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6754	Secure Wireless Ad-hoc Robots on Mission (SWARM) 1
CS 6760	Privacy, Security, and Usability
CS 7785	Special Topics in Network Science
CS 7800	Advanced Algorithms

EXCLUDED COURSES FOR ALL MSECE CONCENTRATIONS

Please see your college administrator for more information.

Courses from the following subject areas may not count toward any concentration within the MSECE program:

CSYE, ENSY, EMGT, INFO, SBSY, TELE

The following CS courses may not count toward any concentration within the MSECE program:

CS 5010	Programming Design Paradigm
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5340	Computer/Human Interaction
CS 5520	Mobile Application Development
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking
CS 5800	Algorithms
CS 6350	Empirical Research Methods
CS 6710	Wireless Network

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Electrical and Computer Engineering with Concentration in Computer Networks and Security, MSECE

The master's degree program in electrical and computer engineering offers in-depth course work within the concentration-choice-related areas. The curriculum is integrated and intensive and is built on state-of-the-art research, taught by faculty who are experts in their areas.

Excluded Courses for All MSECE Concentrations

You **cannot take excluded courses as part of your MSECE program**. Please *do not* petition to take these courses, as any petition to take these courses will be automatically rejected. Courses from the following subject areas may not count toward any concentration within the MSECE program: CSYE, ENSY, EMGT, INFO, SBSY, TELE. Select CS courses are also excluded from all MSECE concentrations. Please see the program requirements tab and your college administrator for more information.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

Gordon Institute of Engineering Leadership

Master's Degree in Electrical and Computer Engineering with a Concentration in Computer Networks and Security with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Electrical and Computer Engineering with a Concentration in Computer Networks and Security in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 48-semester-hour degree and certificate will require 32 semester hours of advisor-approved computer networks and security technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Options

Complete one of the following options:

COURSE WORK OPTION

Depth Courses	
Complete 20 semester hours from the depth course list below. (p. 155)	20
Breadth Courses	
Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. (p. 155)	8
Note: Depth courses cannot be taken for breadth.	
Elective	
Complete 4 semester hours of either depth or breadth courses.	4

THESIS OPTION

Depth Courses	
Complete 12 semester hours from the depth course list below. (p. 155)	12
Breadth Courses	
Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. (p. 155)	8
Note: Depth courses cannot be taken for breadth.	
Elective	
Complete 4 additional semester hours of either depth or breadth courses.	4
Thesis	
EECE 7990 Thesis	8

Course Lists

DEPTH COURSES

EECE 5155	Wireless Sensor Networks and the Internet of Things
EECE 5576	Wireless Communication Systems
EECE 5640	High-Performance Computing
EECE 5698	Special Topics in Electrical and Computer Engineering (Networks: Technology, Economics, Social Interactions)
EECE 5698	Special Topics in Electrical and Computer Engineering (Software Security)
EECE 5698	Special Topics in Electrical and Computer Engineering (Advanced Network Management)
EECE 7204	Applied Probability and Stochastic Processes
EECE 7205	Fundamentals of Computer Engineering
EECE 7364	Mobile and Wireless Networking
EECE 7374	Fundamentals of Computer Networks
EECE 7390	Computer Hardware Security
EECE 7393	Analysis and Design of Data Networks
EECE 7398	Special Topics (Probabilistic System Modeling and Analysis)
EECE 7400	Special Problems in Electrical Engineering
CS 5770	Software Vulnerabilities and Security
CS 6610	Parallel Computing
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6754	Secure Wireless Ad-hoc Robots on Mission (SWARM) 1
CS 6760	Privacy, Security, and Usability
CS 6810	Distributed Algorithms
CS 7785	Special Topics in Network Science

BREADTH COURSES

EECE 5580	Classical Control Systems
EECE 5606	Micro- and Nanofabrication
EECE 5610	Digital Control Systems

EECE 5626	Image Processing and Pattern Recognition
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS
EECE 5639	Computer Vision
EECE 5642	Data Visualization
EECE 5643	Simulation and Performance Evaluation
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 5647	Nanophotonics
EECE 5648	Biomedical Optics
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology
EECE 5664	Biomedical Signal Processing
EECE 5666	Digital Signal Processing
EECE 5680	Electric Drives
EECE 5682	Power Systems Analysis 1
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 5688	Analysis of Unbalanced Power Grids
EECE 5694	Electromagnetic Photonic Devices
EECE 5695	Radio-Frequency and Optical Antennas
EECE 5696	Energy Harvesting Systems
EECE 5697	Acoustics and Sensing
EECE 5698	Special Topics in Electrical and Computer Engineering (Principles of Assistive Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Mobile Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Robotics Sensing and Navigation)
EECE 5698	Special Topics in Electrical and Computer Engineering (Parallel Processing for Data Analytics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Introduction to Multiferroic Materials and Systems)
EECE 7105	Optics for Engineers
EECE 7200	Linear Systems Analysis
EECE 7263	Humanoid Robotics
EECE 7201	Solid State Devices
EECE 7202	Electromagnetic Theory 1
EECE 7203	Complex Variable Theory and Differential Equations
EECE 7211	Nonlinear Control
EECE 7213	System Identification and Adaptive Control
EECE 7214	Optimal and Robust Control
EECE 7220	Power System Analysis 2
EECE 7221	Power System Operation and Control
EECE 7224	Power Systems State Estimation
EECE 7226	Modeling and Simulation of Power System Transients
EECE 7332	Error Correcting Codes
EECE 7228	Advanced Power Electronics
EECE 7238	Special Topics in Electric Drives
EECE 7239	Special Topics in Power Systems
EECE 7240	Analog Integrated Circuit Design
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication
EECE 7243	Integrated Circuit Fabrication
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)
EECE 7245	Microwave Circuit Design for Wireless Communication
EECE 7246	Design and Analysis of Digital Integrated Circuits
EECE 7247	Radio Frequency Integrated Circuit Design
EECE 7258	
EECE 7270	Electromagnetic Theory 2
EECE 7271	Computational Methods in Electromagnetics
EECE 7275	Antennas and Radiation
EECE 7276	Microwave Properties of Materials
EECE 7284	Optical Properties of Matter
EECE 7285	Opto-electronics and Fiber Optics
EECE 7287	Optical Detection
EECE 7293	Modern Imaging
EECE 7295	Applied Magnetism
EECE 7296	Electronic Materials
EECE 7297	Advanced Magnetic Materials—Magnetic Devices
EECE 7298	Magnetic Materials—Fundamentals and Measurements
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics
EECE 7310	Modern Signal Processing
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7312	Statistical and Adaptive Signal Processing
EECE 7313	Pattern Recognition
EECE 7323	Numerical Optimization Methods
EECE 7335	Detection and Estimation Theory
EECE 7336	Digital Communications
EECE 7337	Information Theory
EECE 7352	Computer Architecture
EECE 7353	VLSI Design
EECE 7357	Fault-Tolerant Computers
EECE 7360	Combinatorial Optimization
EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7370	Advanced Computer Vision
EECE 7376	Operating Systems: Interface and Implementation
EECE 7397	Advanced Machine Learning

EECE 7398	Special Topics (Big Data and Sparsity in Control, Machine Learning, and Signal Processing)
EECE 7398	Special Topics (Compilers)
EECE 7398	Special Topics (Advanced Computer Architecture)
EECE 7398	Special Topics (Advanced Topics in Scalable and Sustainable System Design)
EECE 7399	Preparing High-Stakes Written and Oral Materials
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory
CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5600	Computer Systems
CS 6110	Knowledge-Based Systems
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6310	Computational Imaging
CS 6410	Compilers
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6610	Parallel Computing
CS 6810	Distributed Algorithms
CS 7800	Advanced Algorithms

EXCLUDED COURSES FOR ALL MSECE CONCENTRATIONS

Please see your college administrator for more information.

Courses from the following subject areas may not count toward any concentration within the MSECE program:

CSYE, ENSY, EMGT, INFO, SBSY, TELE

The following CS courses may not count toward any concentration within the MSECE program:

CS 5010	Programming Design Paradigm
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5340	Computer/Human Interaction
CS 5520	Mobile Application Development
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking
CS 5800	Algorithms
CS 6350	Empirical Research Methods
CS 6710	Wireless Network

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Electrical and Computer Engineering with Concentration in Computer Vision, Machine Learning, and Algorithms, MSECE

The master's degree program in electrical and computer engineering offers in-depth course work within the concentration-choice-related areas. The curriculum is integrated and intensive and is built on state-of-the-art research, taught by faculty who are experts in their areas.

Excluded Courses for All MSECE Concentrations

You **cannot take excluded courses as part of your MSECE program**. Please *do not* petition to take these courses, as any petition to take these courses will be automatically rejected. Courses from the following subject areas may not count toward any concentration within the MSECE program: CSYE, ENSY, EMGT, INFO, SBSY, TELE. Select CS courses are also excluded from all MSECE concentrations. Please see the program requirements tab and your college administrator for more information.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

Gordon Institute of Engineering Leadership

Master's Degree in Electrical and Computer Engineering with a Concentration in Computer Vision, Machine Learning, and Algorithms with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Electrical and Computer Engineering with a Concentration in Computer Vision, Machine Learning, and Algorithms in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 48-semester-hour degree and certificate will require 32 semester hours of advisor-approved computer vision, machine learning, and algorithms technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Options

Complete one of the following options:

COURSE WORK OPTION

Depth Courses	
Complete 20 semester hours from the depth course list below. (p. 158)	20
Breadth Courses	
Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. (p. 158)	8
Note: Depth courses cannot be taken for breadth.	
Elective	
Complete 4 semester hours of either depth or breadth courses.	4

THESIS OPTION

Depth Courses		
Complete 12 semester hours from the depth course list below. (p. 158)		12
Breadth Courses		
Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. (p. 158)		8
Note: Depth courses cannot be taken for breadth.		
Elective		
Complete 4 additional semester hours from either depth or breadth courses.		4
Thesis		
EECE 7990	Thesis	8

Course Lists

DEPTH COURSES

EECE 5626	Image Processing and Pattern Recognition
EECE 5639	Computer Vision
EECE 5640	High-Performance Computing
EECE 5642	Data Visualization
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 5698	Special Topics in Electrical and Computer Engineering (Mobile Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Robotics Sensing and Navigation)
EECE 5698	Special Topics in Electrical and Computer Engineering (Parallel Processing for Data Analytics)
EECE 7204	Applied Probability and Stochastic Processes
EECE 7205	Fundamentals of Computer Engineering
EECE 7258	
EECE 7313	Pattern Recognition
EECE 7323	Numerical Optimization Methods
EECE 7352	Computer Architecture
EECE 7360	Combinatorial Optimization
EECE 7370	Advanced Computer Vision
EECE 7397	Advanced Machine Learning
EECE 7398	Special Topics (Big Data and Sparsity in Control, Machine Learning and Signal Processing)
EECE 7400	Special Problems in Electrical Engineering
CS 5100	Foundations of Artificial Intelligence
CS 6110	Knowledge-Based Systems
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6310	Computational Imaging
CS 6810	Distributed Algorithms
CS 7800	Advanced Algorithms
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory

BREADTH COURSES

EECE 5155	Wireless Sensor Networks and the Internet of Things (Wireless Sensor Networks and the Internet of Things -- former special topics course)
EECE 5161	Thin Film Technologies (Thin Film Technologies -- former special topics course)
EECE 5576	Wireless Communication Systems
EECE 5580	Classical Control Systems
EECE 5606	Micro- and Nanofabrication
EECE 5610	Digital Control Systems
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS
EECE 5643	Simulation and Performance Evaluation
EECE 5647	Nanophotonics
EECE 5648	Biomedical Optics
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology
EECE 5664	Biomedical Signal Processing
EECE 5666	Digital Signal Processing
EECE 5680	Electric Drives
EECE 5682	Power Systems Analysis 1
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 5688	Analysis of Unbalanced Power Grids
EECE 5694	Electromagnetic Photonic Devices
EECE 5695	Radio-Frequency and Optical Antennas
EECE 5696	Energy Harvesting Systems
EECE 5697	Acoustics and Sensing
EECE 5698	Special Topics in Electrical and Computer Engineering (Software Security)
EECE 5698	Special Topics in Electrical and Computer Engineering (Principles of Assistive Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Networks: Technology, Economics, Social Interactions)
EECE 5698	Special Topics in Electrical and Computer Engineering (Advanced Network Management)
EECE 5698	Special Topics in Electrical and Computer Engineering (Principles of Assistive Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Introduction to Multiferroic Materials and Systems)
EECE 7105	Optics for Engineers
EECE 7200	Linear Systems Analysis
EECE 7201	Solid State Devices
EECE 7202	Electromagnetic Theory 1

EECE 7203	Complex Variable Theory and Differential Equations
EECE 7211	Nonlinear Control
EECE 7213	System Identification and Adaptive Control
EECE 7214	Optimal and Robust Control
EECE 7220	Power System Analysis 2
EECE 7221	Power System Operation and Control
EECE 7224	Power Systems State Estimation
EECE 7226	Modeling and Simulation of Power System Transients
EECE 7228	Advanced Power Electronics (Advanced Power Electronics -- former special topics course)
EECE 7238	Special Topics in Electric Drives
EECE 7239	Special Topics in Power Systems
EECE 7240	Analog Integrated Circuit Design
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication
EECE 7243	Integrated Circuit Fabrication
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)
EECE 7245	Microwave Circuit Design for Wireless Communication
EECE 7246	Design and Analysis of Digital Integrated Circuits
EECE 7247	Radio Frequency Integrated Circuit Design
EECE 7250	Power Management Integrated Circuits (Power Management Integrated Circuits -- former special topics course)
EECE 7263	Humanoid Robotics (Humanoid Robotics -- former special topics course)
EECE 7270	Electromagnetic Theory 2
EECE 7271	Computational Methods in Electromagnetics
EECE 7275	Antennas and Radiation
EECE 7276	Microwave Properties of Materials
EECE 7284	Optical Properties of Matter
EECE 7285	Opto-electronics and Fiber Optics
EECE 7287	Optical Detection
EECE 7293	Modern Imaging
EECE 7295	Applied Magnetism
EECE 7296	Electronic Materials
EECE 7297	Advanced Magnetic Materials—Magnetic Devices
EECE 7298	Magnetic Materials—Fundamentals and Measurements
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics
EECE 7310	Modern Signal Processing
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7312	Statistical and Adaptive Signal Processing
EECE 7332	Error Correcting Codes
EECE 7335	Detection and Estimation Theory
EECE 7336	Digital Communications
EECE 7337	Information Theory
EECE 7353	VLSI Design
EECE 7357	Fault-Tolerant Computers
EECE 7364	Mobile and Wireless Networking
EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7374	Fundamentals of Computer Networks
EECE 7376	Operating Systems: Interface and Implementation
EECE 7390	Computer Hardware Security
EECE 7393	Analysis and Design of Data Networks
EECE 7398	Special Topics (Compilers)
EECE 7398	Special Topics (Probabilistic System Modeling and Analysis)
EECE 7398	Special Topics (Advanced Computer Architecture)
EECE 7398	Special Topics (Advanced Topics in Scalable and Sustainable System Design)
EECE 7399	Preparing High-Stakes Written and Oral Materials
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
CS 5200	Database Management Systems
CS 5600	Computer Systems
CS 5770	Software Vulnerabilities and Security
CS 6410	Compilers
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6610	Parallel Computing
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6754	Secure Wireless Ad-hoc Robots on Mission (SWARM) 1
CS 6760	Privacy, Security, and Usability
CS 6810	Distributed Algorithms
CS 7785	Special Topics in Network Science

EXCLUDED COURSES FOR ALL MSECE CONCENTRATIONS

Please see your college administrator for more information.

Courses from the following subject areas may not count toward any concentration within the MSECE program:

CSYE, ENSY, EMGT, INFO, SBSY, TELE

The following CS courses may not count toward any concentration within the MSECE program:

CS 5010	Programming Design Paradigm
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5340	Computer/Human Interaction
CS 5520	Mobile Application Development
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking

CS 5800	Algorithms
CS 6350	Empirical Research Methods
CS 6710	Wireless Network

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Electrical and Computer Engineering with Concentration in Electromagnetics, Plasma, and Optics, MSECE

The master's degree program in electrical and computer engineering offers in-depth course work within the concentration-choice-related areas. The curriculum is integrated and intensive and is built on state-of-the-art research, taught by faculty who are experts in their areas.

Excluded Courses for All MSECE Concentrations

You **cannot take excluded courses as part of your MSECE program**. Please *do not* petition to take these courses, as any petition to take these courses will be automatically rejected. Courses from the following subject areas may not count toward any concentration within the MSECE program: CSYE, ENSY, EMGT, INFO, SBSY, TELE. Select CS courses are also excluded from all MSECE concentrations. Please see the program requirements tab and your college administrator for more information.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

Gordon Institute of Engineering Leadership

Master's Degree in Electrical and Computer Engineering with a Concentration in Electromagnetics, Plasma, and Optics with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Electrical and Computer Engineering with a Concentration in Electromagnetics, Plasma, and Optics in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16 semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 48-semester-hour degree and certificate will require 32 semester hours of advisor-approved electromagnetics, plasma, and optics technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Options

Complete one of the following options:

COURSE WORK OPTION

Depth Courses

Complete 20 semester hours from the depth course list below. (p. 160)	20

Breadth Courses

Complete 8 semester hours from the breadth course list below. (p. 160)	8
Note: Depth courses cannot be taken for breadth.	

Elective

Complete 4 additional semester hours from either depth or breadth courses.	4

THESIS OPTION

Depth Courses

Complete 12 semester hours from the depth course list below. (p. 160)	12

Breadth Courses

Complete 8 semester hours from the breadth course list below. (p. 160)	8
Note: Depth courses cannot be taken for breadth.	

Elective

Complete 4 additional semester hours from either depth or breadth courses.	4

Thesis

EECE 7990	Thesis	8

Course Lists

DEPTH COURSES

EECE 5648	Biomedical Optics
EECE 5694	Electromagnetic Photonic Devices
EECE 5695	Radio-Frequency and Optical Antennas
EECE 5697	Acoustics and Sensing
EECE 5698	Special Topics in Electrical and Computer Engineering (Introduction to Multiferroic Materials and Systems)
EECE 7105	Optics for Engineers
EECE 7202	Electromagnetic Theory 1
EECE 7203	Complex Variable Theory and Differential Equations
EECE 7270	Electromagnetic Theory 2
EECE 7271	Computational Methods in Electromagnetics
EECE 7275	Antennas and Radiation
EECE 7276	Microwave Properties of Materials
EECE 7284	Optical Properties of Matter
EECE 7285	Opto-electronics and Fiber Optics
EECE 7287	Optical Detection
EECE 7293	Modern Imaging
EECE 7295	Applied Magnetism
EECE 7296	Electronic Materials
EECE 7297	Advanced Magnetic Materials—Magnetic Devices
EECE 7298	Magnetic Materials—Fundamentals and Measurements
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics
EECE 7400	Special Problems in Electrical Engineering

BREADTH COURSES

EECE 5155	Wireless Sensor Networks and the Internet of Things

EECE 5161	Thin Film Technologies
EECE 5576	Wireless Communication Systems
EECE 5580	Classical Control Systems
EECE 5606	Micro- and Nanofabrication
EECE 5610	Digital Control Systems
EECE 5626	Image Processing and Pattern Recognition
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS
EECE 5639	Computer Vision
EECE 5640	High-Performance Computing
EECE 5642	Data Visualization
EECE 5643	Simulation and Performance Evaluation
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 5647	Nanophotonics
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology
EECE 5664	Biomedical Signal Processing
EECE 5666	Digital Signal Processing
EECE 5680	Electric Drives
EECE 5682	Power Systems Analysis 1
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 5688	Analysis of Unbalanced Power Grids
EECE 5696	Energy Harvesting Systems
EECE 5698	Special Topics in Electrical and Computer Engineering (Mobile Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Principles of Assistive Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Networks: Technology, Economics, Social Interactions)
EECE 5698	Special Topics in Electrical and Computer Engineering (Software Security)
EECE 5698	Special Topics in Electrical and Computer Engineering (Advanced Network Management)
EECE 5698	Special Topics in Electrical and Computer Engineering (Robotics Sensing and Navigation)
EECE 5698	Special Topics in Electrical and Computer Engineering (Parallel Processing for Data Analytics)
EECE 7200	Linear Systems Analysis
EECE 7201	Solid State Devices
EECE 7204	Applied Probability and Stochastic Processes
EECE 7205	Fundamentals of Computer Engineering
EECE 7211	Nonlinear Control
EECE 7213	System Identification and Adaptive Control
EECE 7214	Optimal and Robust Control
EECE 7220	Power System Analysis 2
EECE 7221	Power System Operation and Control
EECE 7224	Power Systems State Estimation
EECE 7226	Modeling and Simulation of Power System Transients
EECE 7228	Advanced Power Electronics
EECE 7238	Special Topics in Electric Drives
EECE 7239	Special Topics in Power Systems
EECE 7240	Analog Integrated Circuit Design
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication
EECE 7243	Integrated Circuit Fabrication
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)
EECE 7245	Microwave Circuit Design for Wireless Communication
EECE 7246	Design and Analysis of Digital Integrated Circuits
EECE 7247	Radio Frequency Integrated Circuit Design
EECE 7250	Power Management Integrated Circuits
EECE 7258	
EECE 7263	Humanoid Robotics
EECE 7276	Microwave Properties of Materials
EECE 7284	Optical Properties of Matter
EECE 7295	Applied Magnetism
EECE 7296	Electronic Materials
EECE 7297	Advanced Magnetic Materials—Magnetic Devices
EECE 7298	Magnetic Materials—Fundamentals and Measurements
EECE 7310	Modern Signal Processing
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7312	Statistical and Adaptive Signal Processing
EECE 7313	Pattern Recognition
EECE 7323	Numerical Optimization Methods
EECE 7332	Error Correcting Codes
EECE 7335	Detection and Estimation Theory
EECE 7336	Digital Communications
EECE 7337	Information Theory
EECE 7352	Computer Architecture
EECE 7353	VLSI Design
EECE 7357	Fault-Tolerant Computers
EECE 7360	Combinatorial Optimization
EECE 7364	Mobile and Wireless Networking
EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7370	Advanced Computer Vision
EECE 7374	Fundamentals of Computer Networks
EECE 7376	Operating Systems: Interface and Implementation

EECE 7390	Computer Hardware Security
EECE 7393	Analysis and Design of Data Networks
EECE 7397	Advanced Machine Learning
EECE 7398	Special Topics (Proabilistic Systems Modeling and Analysis)
EECE 7398	Special Topics (Big Data and Sparsity in Control, Machine Learning, and Signal Processing)
EECE 7398	Special Topics (Compilers)
EECE 7398	Special Topics (Advanced Computer Architecture)
EECE 7398	Special Topics (Advanced Topics in Scalable and Sustainable System Design)
EECE 7399	Preparing High-Stakes Written and Oral Materials
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory
CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5600	Computer Systems
CS 5770	Software Vulnerabilities and Security
CS 6110	Knowledge-Based Systems
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6310	Computational Imaging
CS 6410	Compilers
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6610	Parallel Computing
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6754	Secure Wireless Ad-hoc Robots on Mission (SWARM) 1
CS 6760	Privacy, Security, and Usability
CS 6810	Distributed Algorithms
CS 7785	Special Topics in Network Science
CS 7800	Advanced Algorithms

EXCLUDED COURSES FOR ALL MSECE CONCENTRATIONS

Please see your college administrator for more information.

Courses from the following subject areas may not count toward any concentration within the MSECE program:

CSYE, ENSY, EMGT, INFO, SBSY, TELE

The following CS courses may not count toward any concentration within the MSECE program:

CS 5010	Programming Design Paradigm
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5340	Computer/Human Interaction
CS 5520	Mobile Application Development
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking
CS 5800	Algorithms
CS 6350	Empirical Research Methods
CS 6710	Wireless Network

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Electrical and Computer Engineering with Concentration in Microsystems, Materials, and Devices, MSECE

The master's degree program in electrical and computer engineering offers in-depth course work within the concentration-choice-related areas. The curriculum is integrated and intensive and is built on state-of-the-art research, taught by faculty who are experts in their areas.

Excluded Courses for All MSECE Concentrations

You **cannot take excluded courses as part of your MSECE program**. Please *do not* petition to take these courses, as any petition to take these courses will be automatically rejected. Courses from the following subject areas may not count toward any concentration within the MSECE program: CSYE, ENSY, EMGT, INFO, SBSY, TELE. Select CS courses are also excluded from all MSECE concentrations. Please see the program requirements tab and your college administrator for more information.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

Gordon Institute of Engineering Leadership

Master's Degree in Electrical and Computer Engineering with a Concentration in Microsystems, Materials, and Devices with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Electrical and Computer Engineering with a Concentration in Microsystems, Materials, and Devices in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 48-semester-hour degree and certificate will require 32 semester hours of advisor-approved microsystems, materials, and devices technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Options

Complete one of the following options:

COURSE WORK OPTION

Depth Courses

Complete 20 semester hours from the depth course list below. (p. 163)	20

Breadth Courses		
Complete 8 semester hours from the breadth course list below. (p. 163)		8
Note: Depth courses cannot be taken for breadth.		
Elective		
Complete 4 additional semester hours from either depth or breadth courses.		4

THESIS OPTION

Depth Courses		
Complete 12 semester hours from the depth course list below. (p. 163)		12
Breadth Courses		
Complete 8 semester hours from the breadth course list below. (p. 163)		8
Note: Depth courses cannot be taken for breadth.		
Elective		
Complete 4 additional semester hours from either depth or breadth courses.		4
Thesis		
EECE 7990	Thesis	8

Course Lists

DEPTH COURSES

EECE 5161	Thin Film Technologies (Thin Film Technologies -- former special topics course)
EECE 5606	Micro- and Nanofabrication
EECE 5647	Nanophotonics
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology
EECE 5696	Energy Harvesting Systems
EECE 7201	Solid State Devices
EECE 7240	Analog Integrated Circuit Design
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication
EECE 7243	Integrated Circuit Fabrication
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)
EECE 7245	Microwave Circuit Design for Wireless Communication
EECE 7246	Design and Analysis of Digital Integrated Circuits
EECE 7247	Radio Frequency Integrated Circuit Design
EECE 7250	Power Management Integrated Circuits (Power Management Integrated Circuits -- former special topics course)
EECE 7276	Microwave Properties of Materials
EECE 7284	Optical Properties of Matter
EECE 7295	Applied Magnetism
EECE 7296	Electronic Materials
EECE 7297	Advanced Magnetic Materials—Magnetic Devices
EECE 7298	Magnetic Materials—Fundamentals and Measurements
EECE 7353	VLSI Design
EECE 7400	Special Problems in Electrical Engineering

BREADTH COURSES

EECE 5155	Wireless Sensor Networks and the Internet of Things
EECE 5576	Wireless Communication Systems
EECE 5580	Classical Control Systems
EECE 5610	Digital Control Systems
EECE 5626	Image Processing and Pattern Recognition
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS
EECE 5639	Computer Vision
EECE 5640	High-Performance Computing
EECE 5642	Data Visualization
EECE 5643	Simulation and Performance Evaluation
EECE 5648	Biomedical Optics
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 5664	Biomedical Signal Processing
EECE 5666	Digital Signal Processing
EECE 5680	Electric Drives
EECE 5682	Power Systems Analysis 1
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 5688	Analysis of Unbalanced Power Grids
EECE 5694	Electromagnetic Photonic Devices
EECE 5695	Radio-Frequency and Optical Antennas
EECE 5697	Acoustics and Sensing
EECE 5698	Special Topics in Electrical and Computer Engineering (Mobile Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Principles of Assistive Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Networks: Technology, Economics, Social Interactions)
EECE 5698	Special Topics in Electrical and Computer Engineering (Software Security)
EECE 5698	Special Topics in Electrical and Computer Engineering (Advanced Network Management)
EECE 5698	Special Topics in Electrical and Computer Engineering (Robotics Sensing and Navigation)
EECE 5698	Special Topics in Electrical and Computer Engineering (Parallel Processing for Data Analytics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Introduction to Multiferroic Materials and Systems)
EECE 7105	Optics for Engineers

EECE 7200	Linear Systems Analysis
EECE 7202	Electromagnetic Theory 1
EECE 7203	Complex Variable Theory and Differential Equations
EECE 7204	Applied Probability and Stochastic Processes
EECE 7205	Fundamentals of Computer Engineering
EECE 7211	Nonlinear Control
EECE 7213	System Identification and Adaptive Control
EECE 7214	Optimal and Robust Control
EECE 7220	Power System Analysis 2
EECE 7221	Power System Operation and Control
EECE 7224	Power Systems State Estimation
EECE 7226	Modeling and Simulation of Power System Transients
EECE 7228	Advanced Power Electronics
EECE 7238	Special Topics in Electric Drives
EECE 7239	Special Topics in Power Systems
EECE 7258	
EECE 7263	Humanoid Robotics
EECE 7270	Electromagnetic Theory 2
EECE 7271	Computational Methods in Electromagnetics
EECE 7275	Antennas and Radiation
EECE 7285	Opto-electronics and Fiber Optics
EECE 7287	Optical Detection
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics
EECE 7310	Modern Signal Processing
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7312	Statistical and Adaptive Signal Processing
EECE 7313	Pattern Recognition
EECE 7323	Numerical Optimization Methods
EECE 7332	Error Correcting Codes
EECE 7335	Detection and Estimation Theory
EECE 7336	Digital Communications
EECE 7337	Information Theory
EECE 7352	Computer Architecture
EECE 7357	Fault-Tolerant Computers
EECE 7360	Combinatorial Optimization
EECE 7364	Mobile and Wireless Networking
EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7370	Advanced Computer Vision
EECE 7374	Fundamentals of Computer Networks
EECE 7376	Operating Systems: Interface and Implementation
EECE 7390	Computer Hardware Security
EECE 7393	Analysis and Design of Data Networks
EECE 7397	Advanced Machine Learning
EECE 7398	Special Topics (Probabilistic System Modeling and Analysis)
EECE 7398	Special Topics (Big Data and Sparsity in Control, Machine Learning, and Signal Processing)
EECE 7398	Special Topics (Compilers)
EECE 7398	Special Topics (Advanced Computer Architecture)
EECE 7398	Special Topics (Advanced Topics in Scalable and Sustainable System Design)
EECE 7399	Preparing High-Stakes Written and Oral Materials
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory
CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5600	Computer Systems
CS 5770	Software Vulnerabilities and Security
CS 6110	Knowledge-Based Systems
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6310	Computational Imaging
CS 6410	Compilers
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6610	Parallel Computing
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6754	Secure Wireless Ad-hoc Robots on Mission (SWARM) 1
CS 6760	Privacy, Security, and Usability
CS 6810	Distributed Algorithms
CS 7785	Special Topics in Network Science
CS 7800	Advanced Algorithms

EXCLUDED COURSES FOR ALL MSECE CONCENTRATIONS

Please see your college administrator for more information.

Courses from the following subject areas may not count toward any concentration within the MSECE program:

CSYE, ENSY, EMGT, INFO, SBSY, TELE

The following CS courses may not count toward any concentration within the MSECE program:

CS 5010	Programming Design Paradigm
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5340	Computer/Human Interaction
CS 5520	Mobile Application Development
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking
CS 5800	Algorithms
CS 6350	Empirical Research Methods
CS 6710	Wireless Network

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Electrical and Computer Engineering with Concentration in Power Systems, MSECE

The master's degree program in electrical and computer engineering offers in-depth course work within the concentration-choice-related areas. The curriculum is integrated and intensive and is built on state-of-the-art research, taught by faculty who are experts in their areas.

Excluded Courses for All MSECE Concentrations

You **cannot take excluded courses as part of your MSECE program**. Please *do not* petition to take these courses, as any petition to take these courses will be automatically rejected. Courses from the following subject areas may not count toward any concentration within the MSECE program: CSYE, ENSY, EMGT, INFO, SBSY, TELE. Select CS courses are also excluded from all MSECE concentrations. Please see the program requirements tab and your college administrator for more information.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

Gordon Institute of Engineering Leadership

Master's Degree in Electrical and Computer Engineering with a Concentration in Power Systems with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Electrical and Computer Engineering with a Concentration in Power Systems in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 48-semester-hour degree and certificate will require 32 semester hours of advisor-approved power systems technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Options

Complete one of the following options:

COURSE WORK OPTION

Depth Courses	
Complete 20 semester hours from the depth course list below. (p. 165)	20
Breadth Courses	
Complete 8 semester hours from the breadth course list below. (p. 165)	8
Note: Depth courses cannot be taken for breadth.	
Elective	
Complete 4 additional semester hours from either depth or breadth courses.	4

THESIS OPTION

Depth Courses	
Complete 12 semester hours from the depth course list below. (p. 165)	12
Breadth Courses	
Complete 8 semester hours from the breadth course list below. (p. 165)	8
Note: Depth courses cannot be taken for breadth.	
Elective	
Complete 4 additional semester hours from either the depth or breadth courses.	4
Thesis	
EECE 7990 Thesis	8

Course Lists

DEPTH COURSES

EECE 5580	Classical Control Systems
EECE 5610	Digital Control Systems
EECE 5680	Electric Drives
EECE 5682	Power Systems Analysis 1
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 5688	Analysis of Unbalanced Power Grids
EECE 5696	Energy Harvesting Systems
EECE 7200	Linear Systems Analysis
EECE 7211	Nonlinear Control
EECE 7213	System Identification and Adaptive Control
EECE 7214	Optimal and Robust Control
EECE 7220	Power System Analysis 2
EECE 7221	Power System Operation and Control
EECE 7224	Power Systems State Estimation
EECE 7226	Modeling and Simulation of Power System Transients
EECE 7228	Advanced Power Electronics
EECE 7238	Special Topics in Electric Drives
EECE 7239	Special Topics in Power Systems
EECE 7250	Power Management Integrated Circuits
EECE 7323	Numerical Optimization Methods
EECE 7400	Special Problems in Electrical Engineering
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage

BREADTH COURSES

EECE 5155	Wireless Sensor Networks and the Internet of Things
EECE 5161	Thin Film Technologies
EECE 5576	Wireless Communication Systems
EECE 5606	Micro- and Nanofabrication
EECE 5626	Image Processing and Pattern Recognition

EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS
EECE 5639	Computer Vision
EECE 5640	High-Performance Computing
EECE 5642	Data Visualization
EECE 5643	Simulation and Performance Evaluation
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 5647	Nanophotonics
EECE 5648	Biomedical Optics
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology
EECE 5664	Biomedical Signal Processing
EECE 5666	Digital Signal Processing
EECE 5694	Electromagnetic Photonic Devices
EECE 5695	Radio-Frequency and Optical Antennas
EECE 5697	Acoustics and Sensing
EECE 5698	Special Topics in Electrical and Computer Engineering (Mobile Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Principles of Assistive Robotics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Networks: Technology, Economics, Social Interactions)
EECE 5698	Special Topics in Electrical and Computer Engineering (Software Security)
EECE 5698	Special Topics in Electrical and Computer Engineering (Advanced Network Management)
EECE 5698	Special Topics in Electrical and Computer Engineering (Robotics Sensing and Navigation)
EECE 5698	Special Topics in Electrical and Computer Engineering (Parallel Processing for Data Analytics)
EECE 5698	Special Topics in Electrical and Computer Engineering (Introduction to Multiferroic Materials and Systems)
EECE 7105	Optics for Engineers
EECE 7201	Solid State Devices
EECE 7202	Electromagnetic Theory 1
EECE 7203	Complex Variable Theory and Differential Equations
EECE 7204	Applied Probability and Stochastic Processes
EECE 7205	Fundamentals of Computer Engineering
EECE 7240	Analog Integrated Circuit Design
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication
EECE 7243	Integrated Circuit Fabrication
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)
EECE 7245	Microwave Circuit Design for Wireless Communication
EECE 7246	Design and Analysis of Digital Integrated Circuits
EECE 7247	Radio Frequency Integrated Circuit Design
EECE 7258	
EECE 7263	Humanoid Robotics
EECE 7270	Electromagnetic Theory 2
EECE 7271	Computational Methods in Electromagnetics
EECE 7275	Antennas and Radiation
EECE 7276	Microwave Properties of Materials
EECE 7284	Optical Properties of Matter
EECE 7285	Opto-electronics and Fiber Optics
EECE 7287	Optical Detection
EECE 7293	Modern Imaging
EECE 7295	Applied Magnetism
EECE 7296	Electronic Materials
EECE 7297	Advanced Magnetic Materials—Magnetic Devices
EECE 7298	Magnetic Materials—Fundamentals and Measurements
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics
EECE 7310	Modern Signal Processing
EECE 7311	Two Dimensional Signal and Image Processing
EECE 7312	Statistical and Adaptive Signal Processing
EECE 7313	Pattern Recognition
EECE 7323	Numerical Optimization Methods
EECE 7332	Error Correcting Codes
EECE 7335	Detection and Estimation Theory
EECE 7336	Digital Communications
EECE 7337	Information Theory
EECE 7352	Computer Architecture
EECE 7353	VLSI Design
EECE 7357	Fault-Tolerant Computers
EECE 7360	Combinatorial Optimization
EECE 7364	Mobile and Wireless Networking
EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7370	Advanced Computer Vision
EECE 7374	Fundamentals of Computer Networks
EECE 7376	Operating Systems: Interface and Implementation
EECE 7390	Computer Hardware Security
EECE 7393	Analysis and Design of Data Networks
EECE 7397	Advanced Machine Learning
EECE 7398	Special Topics (Probabilistic System Modeling and Analysis)
EECE 7398	Special Topics (Big Data and Sparsity in Control, Machine Learning, and Signal Processing)
EECE 7398	Special Topics (Compilers)

EECE 7398	Special Topics (Advanced Computer Architecture)
EECE 7398	Special Topics (Advanced Topics in Scalable and Sustainable System Design)
EECE 7399	Preparing High-Stakes Written and Oral Materials
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory
CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5600	Computer Systems
CS 5770	Software Vulnerabilities and Security
CS 6110	Knowledge-Based Systems
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
CS 6310	Computational Imaging
CS 6410	Compilers
CS 6510	Advanced Software Development
CS 6520	Methods of Software Development
CS 6610	Parallel Computing
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6754	Secure Wireless Ad-hoc Robots on Mission (SWARM) 1
CS 6760	Privacy, Security, and Usability
CS 6810	Distributed Algorithms
CS 7785	Special Topics in Network Science
CS 7800	Advanced Algorithms

EXCLUDED COURSES FOR ALL MSECE CONCENTRATIONS

Please see your college administrator for more information.

Courses from the following subject areas may not count toward any concentration within the MSECE program:

CSYE, ENSY, EMGT, INFO, SBSY, TELE

The following CS courses may not count toward any concentration within the MSECE program:

CS 5010	Programming Design Paradigm
CS 5320	Digital Image Processing
CS 5330	Pattern Recognition and Computer Vision
CS 5340	Computer/Human Interaction
CS 5520	Mobile Application Development
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking
CS 5800	Algorithms
CS 6350	Empirical Research Methods
CS 6710	Wireless Network

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Electrical and Computer Engineering Leadership, MSECEL

The Gordon Engineering Leadership Program is a transformational, technical, and challenging graduate-level learning experience targeted for engineering professionals.

The Gordon Institute, in collaboration with the College of Engineering, offers the **Master of Science in Electrical and Computer Engineering Leadership (MSECEL)** along with the **Graduate Certificate in Engineering Leadership** as formal recognition of the combined focus in electrical and computer engineering technical skills and midlevel engineers' leadership acumen and broadened cross-functional capabilities.

Pursuing the MSECEL and the graduate certificate allows participants to:

- Enhance technical knowledge in electrical and computer engineering
- Take part in a hands-on curriculum (http://www.northeastern.edu/gordonleadership/about-the-institute/curriculum) taught by industry-experienced professors
- Work with peers from across engineering fields on leadership skills development
- Receive one-on-one mentoring from industry experts and faculty

The Gordon Engineering Leadership Program anchors around an intense, market-worthy challenge project based on your organization's strategic needs. This is a unique opportunity to apply your classroom experience to a professional setting, potentially further accelerating your career.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Leadership		
ENLR 5121	Engineering Leadership 1	2
ENLR 5122	Engineering Leadership 2	2
Foundations		
ENLR 5131	Scientific Foundations of Engineering 1	2
ENLR 5132	Scientific Foundations of Engineering 2	2
Project		
ENLR 7440	Engineering Leadership Challenge Project 1	4
ENLR 7442	Engineering Leadership Challenge Project 2	4
Concentration Courses		
Complete 16 semester hours from any of the approved depth/breadth course lists within any of the seven EECE concentrations. Students are encouraged to take at least three courses within the same concentration.		16

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Mechanical and Industrial Engineering

Website (http://www.mie.neu.edu/mie/degrees-programs/graduate-studies)

Hanchen Huang, PhD

Professor and Chair

Nader Jalili, PhD
Professor and Associate Chair for Graduate Studies and Research

334 Snell Engineering Center
617.373.2740
617.373.2921 (fax)
Tess Waggett, Business Manager, tess.waggett@northeastern.edu

Background and Overview

The Department of Mechanical and Industrial Engineering (MIE) offers comprehensive research and educational programs for both Master of Science (MS) and Doctor of Philosophy (PhD) students in both traditional mechanical and industrial engineering, operations research, as well as applied programs. Our cutting-edge and vibrant doctoral programs include PhDs in industrial engineering, mechanical engineering, and an interdisciplinary PhD (housed in the College of Engineering); while our MS degree programs consist of industrial engineering, operations research, as well as mechanical engineering with concentrations in material science, mechanics and design, mechatronics, thermofluids, and general mechanical engineering. These extensive programs and concentrations allow for the selection of a degree that meets a wide variety of personal and professional goals.

Our Mission

In accordance with the missions of Northeastern University and the College of Engineering, the primary mission of the MIE department is the education of PhD and MS students in the fundamental principles and practice of mechanical and industrial engineering as well as operations research. Furthermore, the MIE department will, through the basic and applied research done by its faculty and students, contribute to the advancement of the body of knowledge useful to industry and government of the Commonwealth as well as the nation.

Master of Science Degree

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science degree in engineering, science, mathematics, or an equivalent field. Students in all MS programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000 (see table below). Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

Degree Requirements	Course Work Only	With Project	With Thesis
Required and elective courses	32 SH	28 SH	24 SH
MEIE 6800 Technical Writing (not required for BS/MS students)	N/A	0 SH	0 SH
MEIE 6850 Research Seminar in Mechanical and Industrial Engineering	N/A	0 SH	0 SH
Project/Thesis	0 SH	4 SH	8 SH
Minimum semester hours required	**32 SH**	**32 SH**	**32 SH**

The MIE department offers MS degrees in both industrial engineering and operation research. The MIE department also offers an MS degree in mechanical engineering with one of the following five concentrations:

- General mechanical engineering
- Material science
- Mechanics and design
- Mechatronics
- Thermofluids

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering Leadership Program (p. 204) in combination with the MS degree.

Doctor of Philosophy Degree

The MIE department admits applicants to the PhD program either directly after earning a suitable bachelor's degree (direct entry) or after earning a master's degree (advanced entry). Upon acceptance into the program, an applicant is designated as a doctoral student. This designation is changed to doctoral candidate upon successful completion of the doctoral qualifying examinations (both written and oral area exams) and all the required course work. The PhD is awarded to students who demonstrate high academic achievement and research competence in the fields of mechanical or industrial engineering. The MIE department expects all successful doctoral candidates to show depth of knowledge and research innovation in their chosen field of specialization.

Programs

Doctor of Philosophy (PhD)

- Industrial Engineering (p. 169)
- Industrial Engineering—Advanced Entry (p. 171)
- Mechanical Engineering (p. 174)
- Mechanical Engineering—Advanced Entry (p. 176)

Master of Science (MS)

- Data Analytics Engineering (p. 179)

Master of Science in Industrial Engineering (MSIE)

- Industrial Engineering (p. 181)

Master of Science in Mechanical Engineering (MSME)

- Mechanical Engineering with Concentration in General Mechanical Engineering (p. 183)
- Mechanical Engineering with Concentration in Mechanics and Design (p. 187)
- Mechanical Engineering with Concentration in Material Science (p. 185)
- Mechanical Engineering with Concentration in Mechatronics (p. 188)

- Mechanical Engineering with Concentration in Thermofluids (p. 190)

Master of Science in Operations Research (MSOR)

- Operations Research (p. 192)

Graduate Certificate

- Data Analytics Engineering (p. 194)
- Data Mining Engineering (p. 194)

Industrial Engineering, PhD

Requirements

The Doctor of Philosophy (PhD) is awarded to students who demonstrate high academic achievement and research competence in the field of industrial engineering. To earn a PhD, a student must complete approved and advanced course work and submit and defend an original dissertation of independent research. The Department of Mechanical and Industrial Engineering (MIE) expects all successful doctoral candidates to show depth of knowledge and research innovation in their chosen field of specialization.

The MIE department admits applicants to the PhD program either directly after earning a suitable bachelor's degree (i.e., bachelor's entry) or after earning a master's degree (i.e., advanced entry). Upon acceptance into the program, an applicant is designated as a doctoral student. This designation is changed to doctoral candidate upon successful completion of the doctoral qualifying examinations (both written and oral area exams) as well as all the required course work.

Academic and Research Advisors

PhD students must find a research advisor within their first year of study. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Students are advised by the academic advisor of their discipline before they select their research advisor(s).

Change of Research Advisor

Students who want to change their research advisors need to use the MIE petition form. The petition form needs to be signed both by the student and the student's current and future research advisors. The signed form then needs to be submitted to the MIE department for further processing.

Course Requirements and Plan of Study

A typical program of study includes at least 48 semester hours of course work beyond a bachelor's degree. Students who choose to get a master's degree *along the way* to PhD, must complete a total of 56 semester hours (32 semester hours to earn a master's degree and an additional 24 semester hours in order to earn a PhD). The 32 semester hours of course work that apply toward the master's degree may include up to 8 semester hours of thesis or 4 semester hours of project or approved independent study course work.

All MIE PhD students must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during their first year of full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. The outcome of this online session will be filed with the student's records.

Each doctoral student, together with his or her research advisor, should develop an initial program during the first semester of study. The final program is also subject to the approval of the area examining committee, who will add the program of study to the student's record upon admission to doctoral candidacy.

Students may petition the MIE Graduate Affairs Committee to substitute up to 4 semester hours of Independent Study (IE 7978) as part of their required course work. An independent study must be approved by the research advisor.

PhD Candidacy

To qualify as a doctoral candidate, a doctoral student must successfully complete the doctoral qualifying examinations (both a written comprehensive exam and an oral exam—see below) as well as all the required course work.

Doctoral Qualifying Examinations

Background and motivation: To demonstrate breadth and depth in each of the subject exams, crossover and merging exams are necessary in an effort to provide students with an opportunity to master the core disciplines in mechanical or industrial engineering (at both undergraduate and graduate levels) along with a focus area of importance to their specialization. These exams also provide an assessment as to whether students have adequate knowledge to pursue advanced study and possess attributes of a doctoral candidate by demonstrating understanding of and the ability to apply fundamental principles. Also, an oral exam tied to the written exams is necessary in an effort to evaluate a student's potential to perform independent research in the chosen field of specialization for the doctoral program.

Doctoral qualifying examinations framework: The doctoral qualifying examinations consist of the following two parts:

1. Two ***written comprehensive*** exams, which are respectively referred to as exam A and exam B
2. An ***oral*** exam to be administered no later than the end of the semester in which the written exams are taken and passed

Written Comprehensive Examinations

All doctoral students admitted directly with a bachelor's degree must take the written comprehensive exams no later than the first time that it is offered after their first two years of study. The written comprehensive exams include two exams, **exam A** and **exam B,** and are given on Thursday and Friday of the first week of classes during regular semesters. A complete list of these exams along with topical coverage and details are provided on the MIE department graduate website (http://www.mie.neu.edu/mie/degrees-programs/graduate-studies). Students should also consult extensively with their research advisor regarding all aspects of the qualifying exams.

Written Comprehensive Exams Rules

Exam A, about four to six hours in length, should be selected from the list of major exams based on the student's concentration (i.e., industrial engineering—IND), see below. No deviation from this rule will be permitted. As listed below, exam B, about one to two hours in length, should be selected from the list of exams B for PhD degree program in industrial engineering (see below). Only one exam from this list should be selected. All students are required to have their research advisor's approval on selection of exam B prior to registering to take the written

comprehensive exams. Note that exam B cannot be similar or close to one of the topics covered in exam A.

List of exams A and B based on student's research concentration:

Exams A for Industrial Engineering PhD Students:

- **Industrial Engineering (IND):** Probability (IND1), Statistics and Probabilistic OR (IND2), and Deterministic OR (IND3)

Sample Exams B for Industrial Engineering PhD Students (select one Exam B):

- Data Mining (DMN)
- Human-Machine Systems (HMS)
- Manufacturing Systems (MFS)
- Networks and Advanced Optimization (NAO)
- Reliability and Quality Assurance (RQA)
- Supply Chain Engineering (SCE)

Oral Examination

The objective of the oral exam is to assess a student's potential to perform independent research in the chosen field of specialization. This exam shall be administered no later than the end of the semester in which the written exams are taken and passed. The exam shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate.

Oral examination procedure: The student's research advisor convenes and chairs an oral examination committee comprised of a minimum of three faculty members deemed appropriate by the research advisor. This committee provides a set of technical papers pertinent to the student's research area at least one month before the examination. The oral examination committee will then conduct the exam that comprises the following two parts (both completed in a one-hour session):

1. A 30-minute oral presentation on a selected number of papers out of the assigned technical papers
2. A 30-minute oral exam by committee members' questions and evaluation of the student covering topics specifically related to the student's research area

Grading Procedure

Grading procedure and results of the written comprehensive examination: The MIE Graduate Affairs Committee will review all students' performance in the written comprehensive exams. Depending on the results of both major and minor exams and in consultation with the student's research advisor, the Graduate Affairs Committee will recommend one of the following three possible options:

1. *No invitation to oral exam:* The student will be dismissed from the program. He or she may be granted a master's degree if the requirements are already met; otherwise, the student may continue to fulfill the requirements for a master's degree in industrial engineering (IE), mechanical engineering (ME), or operations research (OR).
2. *No invitation to oral exam yet:* The student will be asked to retake the written exam(s) again in the next offering and/or take additional courses.
3. *Student is invited to oral exam.*

The Graduate Affairs Committee makes its final recommendation considering all aspects of the exam including, but not limited to, examiners' reports and results and the student's research performance and course work. The Graduate Affairs Committee reserves the right to recommend option 1 above for students who register for the exams but do not show up.

Grading procedure and results of the oral examination: If the student's performance in the oral exam is not satisfactory, the student will be dismissed from the program. He or she may be granted a master's degree if the requirements are met; otherwise, the student may continue to fulfill the requirements for a master's degree in industrial engineering (IE), mechanical engineering (ME), or operations research (OR).

Upon successfully passing the oral exam, the student continues in the PhD program. Upon passing all the required course work, he or she will become a PhD candidate. The results of written and oral exams and any recommended course work will become part of the student's record.

Appeal Procedure

The preliminary qualifying examination process provides means for reevaluation for students who fail one or more exams to appeal the Graduate Affairs Committee decision. All communications related to these examinations should be coordinated through the student's research advisor. Only the student's research advisor may request the MIE Graduate Affairs Committee to reevaluate the student's failed exams using the appeal form found at the link (http://www.coe.neu.edu/sites/default/files/pdfs/coe/gse/miepetitionform.pdf).

PhD Students Changing Their Program

PhD students who, for any reason, decide to change their program (i.e., from PhD in ME to PhD in IE or vice versa) must take (or retake) the doctoral qualifying examinations (both written comprehensive exams and oral exam) based on the student's new major research area (i.e., industrial engineering, materials, mechanics, mechatronics, or thermofluids).

Interdisciplinary PhD Students with MIE as the Home Department

Students pursuing the College of Engineering (COE) interdisciplinary PhD program with the MIE department as their home department must take one of the major written comprehensive exams (exam A) of the MIE doctoral qualifying examinations. The minor exam (exam B) can be substituted with appropriate exam(s) from other department(s) involved with the student's interdisciplinary PhD program.

Dissertation Proposal Preparation and Presentation Timing

Students must present their dissertation proposal no more than 12 months after successfully completing the oral exam. In addition, the presentation of the dissertation proposal and the actual dissertation defense (see below) shall be no less than 6 months apart. The student's dissertation committee will invite any additional faculty deemed appropriate to that field; this dissertation committee will then conduct the dissertation proposal session. Each student's dissertation committee must be comprised of at least three members, including the research advisor. At least two of those three members must be full-time MIE faculty members.

Dissertation Course Requirements

Upon successful completion of the doctoral qualifying examinations (both written preliminary and oral exams) as well as all the required course work, the doctoral candidate, in consultation with his or her research advisor, must register in two consecutive semesters (may include full summer term) for Dissertation (IE 9990). Upon completion of this sequence, the student must then register for Dissertation Continuation (IE 9996) in every semester (in each fall and spring semester and also in the summer term if summer is the student's last semester) until the dissertation is completed. Students may not register

for Dissertation Continuation (IE 9996) until they complete the two-semester registration sequence for Dissertation (IE 9990).

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Candidacy Preparation—Doctoral (IE 8960), can be taken if needed to meet the full-time course registration requirement. Candidacy Preparation—Doctoral (IE 8960) is an individual instruction course, billed as one semester hour, and graded as S or U. This course does not have any course content, and students must register in a section for which their research or academic advisor is listed as the "instructor" in the online registration system.

Final Oral (Dissertation Defense) Examination

All doctoral candidates must pass a final oral exam. This exam will be scheduled once the dissertation committee agrees that the candidate's research has reached a stage where it is appropriate for a formal presentation and after completion of all other requirements for the PhD, including all course work approved in the final program of study. The objective of the exam is for the candidate to present and defend the results of the dissertation research and to demonstrate depth of knowledge and significant expertise in the area of that research under questioning from the dissertation committee and other attendees.

The exam shall be publicly advertised at least one week in advance and all faculty members may attend and participate. At the conclusion of the presentation and subsequent questions period, the dissertation committee will convene to determine the outcome. The committee may recommend that the candidate be awarded the PhD or may require additional research and/or modifications of the dissertation. In some cases, candidates may be asked to present an additional final oral dissertation defense.

Residency Requirement

After achieving PhD candidacy, the university residency requirement is satisfied by two semesters of full-time graduate registration or four semesters of part-time graduate registration. Students must be continually enrolled during the pursuit of their dissertation.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Doctoral qualifying exams (both written comprehensive and oral area exams)
Annual review
Dissertation committee formation
Dissertation proposal
Dissertation defense

General Requirements

Seminars		
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Approved Course Work		
Requires 48 semester hours of course work, including up to 4 semester hours of Independent Study (IE 7978). Students who choose to get a master's degree along the way to PhD must complete a total of 56 semester hours (32 semester hours toward the sought master's degree and 24 semester hours beyond the earned master's degree). The 32 semester hours applied toward the master's degree may include up to 8 semester hours of MS Thesis or 4 semester hours of MS Project or approved independent study course work. Please consult your faculty advisor for acceptable courses.		48

Dissertation Courses

Complete the following (repeatable) course twice. Must register in two consecutive semesters (may include full summer term).

ME 9990	Dissertation

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.000 GPA required

Industrial Engineering, PhD—Advanced Entry

Requirements

The Doctor of Philosophy (PhD) is awarded to students who demonstrate high academic achievement and research competence in the field of industrial engineering. To earn a PhD, a student must complete approved and advanced course work and submit and defend an ordshow depth of knowledge and research innovation in their chosen field of specialization.

The MIE department admits applicants to the PhD program either directly after earning a suitable bachelor's degree (i.e., direct entry) or after earning a master's degree (i.e., advanced entry). Upon acceptance into the program, an applicant is designated as a doctoral student. This designation is changed to doctoral candidate upon successful completion of the doctoral qualifying examinations (both written and oral area exams) and all the required course work.

Academic and Research Advisors

PhD students must find a research advisor within their first year of study. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Students are advised by the academic advisor of their discipline before they select their research advisor(s).

Change of Research Advisor

Students who want to change their research advisors need to use the MIE petition form. The petition form needs to be signed both by the student and the student's current and future research advisors. The signed form needs to be submitted to the MIE department for further processing.

Course Requirements and Plan of Study

A typical program of study includes at least 24 semester hours of course work beyond a master's degree. All MIE PhD students must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during their first year of full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. The outcome of the online session will be filed with the student's records.

Each doctoral student, together with his or her research advisor, should develop an initial program during the first semester of study. The final program is also subject to approval of the area examining committee that will add the program of study to the student's record upon admission to doctoral candidacy.

Students may petition the MIE Graduate Affairs Committee to substitute up to 4 semester hours of Independent Study (IE 7978) as part of their required course work. An independent study must be approved by the research advisor.

PhD Candidacy

To qualify as a doctoral candidate, a doctoral student must successfully complete the doctoral qualifying examinations (both a written comprehensive exam and an oral exam—see below) as well as all the required course work.

Doctoral Qualifying Examinations

Background and motivation: To demonstrate breadth and depth in each of the subject exams, crossover and merging exams are necessary in an effort to provide students with an opportunity to master the core disciplines in mechanical or industrial engineering (at both undergraduate and graduate levels) along with a focus area of importance to their specialization. These exams also provide an assessment as to whether students have adequate knowledge to pursue advanced study and possess attributes of a doctoral candidate by demonstrating understanding of and the ability to apply fundamental principles. Also, an oral exam tied to the written exams is necessary in an effort to evaluate the student's potential to perform independent research in the chosen field of specialization for the doctoral program.

Doctoral qualifying examinations framework: The doctoral qualifying examinations consist of the following two parts:

1. Two ***written comprehensive*** exams, which are respectively referred to as exam A and exam B
2. An ***oral*** exam to be administered no later than the end of the semester in which the written exams are taken and passed

Written Comprehensive Examinations

All doctoral students admitted directly with a bachelor's degree must take the written comprehensive exams no later than the first time that it is offered after their first two years of study. The written comprehensive exams include two exams, **exam A** and **exam B,** and are given on Thursday and Friday of the first week of classes during regular semesters. A complete list of these exams along with topical coverage and details are provided on the MIE department graduate website (http://www.mie.neu.edu/mie/degrees-programs/graduate-studies). Students should also consult extensively with their research advisor regarding all aspects of the qualifying exams.

Written Comprehensive Exams Rules

Exam A, about four to six hours in length, should be selected from the list of major exams based on the student's concentration (i.e., industrial engineering—IND), see below. No deviation from this rule will be permitted. As listed below, exam B, about one to two hours in length, should be selected from the list of exams B for PhD degree program in industrial engineering (see below). Only one exam from this list should be selected. All students are required to have their research advisor's approval on selection of exam B prior to registering to take the written comprehensive exams. Note that exam B cannot be similar or close to one of the topics covered in exam A.

List of exams A and B based on student's research concentration:

Exams A for Industrial Engineering PhD Students:

- **Industrial Engineering (IND):** Probability (IND1), Statistics and Probabilistic OR (IND2), and Deterministic OR (IND3)

Sample Exams B for Industrial Engineering PhD Students (select one Exam B):

- Data Mining (DMN)
- Human-Machine Systems (HMS)
- Manufacturing Systems (MFS)
- Networks and Advanced Optimization (NAO)
- Reliability and Quality Assurance (RQA)
- Supply Chain Engineering (SCE)

Oral Examination

The objective of the oral exam is to assess a student's potential to perform independent research in the chosen field of specialization. This exam shall be administered no later than the end of the semester in which the written exams are taken and passed. The exam shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate.

Oral examination procedure: The student's research advisor convenes and chairs an oral examination committee comprised of a minimum of three faculty members deemed appropriate by the research advisor. This committee provides a set of technical papers pertinent to the student's research area at least one month before the examination. The oral examination committee will then conduct the exam that comprises the following two parts (both completed in a one-hour session):

1. A 30-minute oral presentation on a selected number of papers out of the assigned technical papers
2. A 30-minute oral exam by committee members' questions and evaluation of the student covering topics specifically related to the student's research area

Grading Procedure

Grading procedure and results of the written comprehensive examination: The MIE Graduate Affairs Committee will review all students' performance in the written comprehensive exams. Depending on the results of both major and minor exams and in consultation with the student's research advisor, the Graduate Affairs Committee will recommend one of the following three possible options:

1. *No invitation to oral exam:* The student will be dismissed from the program. He or she may be granted a master's degree if the requirements are already met; otherwise, the student may continue to fulfill the requirements for a master's degree in industrial engineering (IE), mechanical engineering (ME), or operations research (OR).
2. *No invitation to oral exam yet:* The student will be asked to retake the written exam(s) again in the next offering and/or take additional courses.
3. *Student is invited to oral exam.*

The Graduate Affairs Committee makes its final recommendation considering all aspects of the exam including, but not limited to, examiners' reports and results and student's research performance and course work. The Graduate Affairs Committee reserves the rights to

recommend option 1 above for students who register for the exams but do not show up.

Grading procedure and results of the oral examination: If the student's performance in the oral exam is not satisfactory, the student will be dismissed from the program. He or she may be granted a master's degree if the requirements are met; otherwise, the student may continue to fulfill the requirements for a master's degree in industrial engineering (IE), mechanical engineering (ME), or operations research (OR).

Upon successfully passing the oral exam, the student continues in the PhD program. Upon passing all the required course work, he or she will become a PhD candidate. The results of written and oral exams and any recommended course work will become part of the student's record.

Appeal Procedure

The preliminary qualifying examination process provides means for reevaluation for students who fail one or more exams to appeal the Graduate Affairs Committee decision. All communications related to these examinations should be coordinated through the student's research advisor. Only the student's research advisor may request the MIE Graduate Affairs Committee to reevaluate the student's failed exams using the appeal form found at the link (http://www.coe.neu.edu/sites/default/files/pdfs/coe/gse/miepetitionform.pdf).

PhD Students Changing Their Program

PhD students who, for any reason, decide to change their program (i.e., from PhD in ME to PhD in IE or vice versa) must take (or retake) the doctoral qualifying examinations (both written comprehensive exams and oral exam) based on the student's new major research area (i.e., industrial engineering, materials, mechanics, mechatronics, or thermofluids).

Interdisciplinary PhD Students with MIE as the Home Department

Students pursuing the College of Engineering (COE) interdisciplinary PhD program with the MIE department as their home department must take one of the major written comprehensive exams (exam A) of the MIE doctoral qualifying examinations. The minor exam (exam B) can be substituted with appropriate exam(s) from other department(s) involved with the student's interdisciplinary PhD program.

Dissertation Proposal Preparation and Presentation Timing

Students must present their dissertation proposal no more than 12 months after successfully completing the oral exam. In addition, the presentation of the dissertation proposal and the actual dissertation defense (see below) shall be no less than 6 months apart. The student's dissertation committee will invite any additional faculty deemed appropriate to that field; this dissertation committee will then conduct the dissertation proposal session. Each student's dissertation committee must be comprised of at least three members, including the research advisor. At least two of those three members must be full-time MIE faculty members.

Dissertation Course Requirements

Upon successful completion of the doctoral qualifying examinations (both written preliminary and oral exams) as well as all the required course work, the doctoral candidate, in consultation with his or her research advisor, must register in two consecutive semesters (may include full summer term) for Dissertation (IE 9990). Upon completion of this sequence, the student must then register for Dissertation Continuation (IE 9996) in every semester (in each fall and spring term and also in the summer term if summer is the student's last semester) until the dissertation is completed. Students may not register for Dissertation Continuation (IE 9996) until they fulfill the two-semester registration sequence for Dissertation (IE 9990)

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Candidacy Preparation—Doctoral (IE 8960), can be taken if needed to fulfill the full-time course registration requirement. Candidacy Preparation—Doctoral (IE 8960) is an individual instruction course, billed as one semester hour, and graded as S or U. Candidacy Preparation—Doctoral (IE 8960) does not have any course content, and students must register in a section for which their research or academic advisor is listed as the "instructor" in the online course registration system.

Final Oral (Dissertation Defense) Examination

All doctoral candidates must pass a final oral exam. This exam will be scheduled once the dissertation committee agrees that the candidate's research has reached a stage where it is appropriate for a formal presentation and after completion of all other requirements for the PhD, including all course work approved in the final program of study. The objective of the exam is for the candidate to present and defend the results of the dissertation research and to demonstrate depth of knowledge and significant expertise in the area of that research under questioning from the dissertation committee and other attendees.

The exam shall be publicly advertised at least one week in advance and all faculty members may attend and participate. At the conclusion of the presentation and subsequent questions period, the dissertation committee will convene to determine the outcome. The committee may recommend that the candidate be awarded the PhD or may require additional research and/or modifications of the dissertation. In some cases, candidates may be asked to present an additional final oral dissertation defense.

Residency Requirement

After achieving PhD candidacy, the university residency requirement is satisfied by two semesters of full-time graduate registration or four semesters of part-time graduate registration. Students must be continually enrolled during the pursuit of their dissertation.

Program Requirements

Master's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Doctoral qualifying exams (both written comprehensive and oral area exams)
Annual review
Dissertation committee formation
Dissertation proposal
Dissertation defense

General Requirements

Seminars		
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Approved Course Work		
Requires 24 semester hours of course work, including up to 4 semester hours of Independent Study (IE 7978). Please consult your faculty advisor for acceptable courses.		24

Dissertation Courses

Complete the following (repeatable) course twice. Must register in two consecutive semesters (may include full summer term):

ME 9990	Dissertation

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Mechanical Engineering, PhD

Requirements

The PhD is awarded to students who demonstrate high academic achievement and research competence in the fields of mechanical engineering. To earn a PhD, a student must complete an approved, rigorous program of advanced course work and submit and defend an original dissertation of independent research. The Department of Mechanical and Industrial Engineering (MIE) expects all successful doctoral candidates to show depth of knowledge and research innovation in their chosen field of specialization.

The MIE department admits applicants to the PhD program either directly after earning a suitable bachelor's degree (i.e., direct entry) or after earning a master's degree (i.e., advanced entry). Upon acceptance into the program, an applicant is designated as a doctoral student. This designation is changed to doctoral candidate upon successful completion of the doctoral qualifying examinations (both written and oral area exams) as well as all the required course work.

Academic and Research Advisors

PhD students must find a research advisor within their first year of study. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Students are advised by the academic advisor of their discipline before they select their research advisor(s).

Change of Research Advisor

Students who wish to change their research advisor need to use the MIE petition form to make that request. The petition form must be signed by the student and by the student's current and future research advisor. The signed petition form should then be submitted to the MIE department for further processing.

Course Requirements and Plan of Study

A typical program of study includes at least 48 semester hours of course work beyond a bachelor's degree. Those students who choose to get an MS degree *along the way* to PhD, must complete a total of 56 semester hours (32 semester hours to earn an MS degree and 24 semester hours beyond the earned MS). The 32 semester hours of course work applied toward the master's degree may include up to 8 semester hours of MS thesis or 4 semester hours of project or approved independent study.

All MIE PhD students must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during their first year of full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. Outcome of the online session will be filed with the student's records.

Each doctoral student, together with his or her research advisor, should develop an initial program during the first semester of study. The final program is also subject to the approval of the area examining committee, who will add the program of study to the student's record upon admission to doctoral candidacy.

Students may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour Independent Study (ME 7978) as part of their required course work. An independent study must be approved by the research advisor.

PhD Candidacy

To qualify as a doctoral candidate, a doctoral student must successfully complete the doctoral qualifying examinations (both a written comprehensive exam and an oral exam—see below) as well as all the required course work.

Doctoral Qualifying Examinations

Background and motivation: To demonstrate breadth and depth in each of the subject exams, crossover and merging exams are necessary in an effort to provide students with an opportunity to master the core disciplines in mechanical or industrial engineering (at both undergraduate and graduate levels) along with a focus area of importance to their specialization. These exams also provide an assessment as to whether students have adequate knowledge to pursue advanced study and possess attributes of a doctoral candidate by demonstrating understanding of and the ability to apply fundamental principles. Also, an oral exam tied to the written exams is necessary in an effort to evaluate a student's potential to perform independent research in the chosen field of specialization for the doctoral program.

Doctoral qualifying examinations framework: The doctoral qualifying examinations consist of the following two parts:

1. Two ***written comprehensive*** exams, which are respectively referred to as exam A and exam B
2. An ***oral*** exam to be administered no later than the end of the semester in which the written exams are taken and passed

Written Comprehensive Examinations

All doctoral students admitted directly with a bachelor's degree must take the written comprehensive exams no later than the first time that it is offered after their first two years of study. The written comprehensive exams include two exams, **exam A** and **exam B,** and are given on Thursday and Friday of the first week of classes during regular semesters. A complete list of these exams along with topical coverage and details are provided on the MIE department graduate website (http://www.mie.neu.edu/mie/degrees-programs/graduate-studies). Students should also consult extensively with their research advisor regarding all aspects of the qualifying exams.

Written Comprehensive Exams Rules

Exam A, about four to six hours in length, should be selected from the list of major exams based on the student's concentration (i.e., materials, mechanics, mechatronics, or thermofluids, see below). No deviation from this rule will be permitted. As listed below, exam B, about one to two hours in length, should be selected from the list of exams B for PhD degree program in industrial engineering (see below). Only one exam from this list should be selected. All students are required to have their research advisor's approval on selection of exam B prior to registering

to take the written comprehensive exams. Note that exam B cannot be similar or close to one of the topics covered in exam A.

List of exams A and B based on student's research concentration:

Exams A for Mechanical Engineering PhD Students (select one Exam A):

- **Materials Science Engineering (MSE):** Kinetics of Materials (MSE1), Thermodynamics of Materials (MSE2); and Process, Structure, Property, and Performance of Materials (MSE3)
- **Mechanics (MEC)**: Mechanics of Deformable Media (MEC1), Dynamics and Vibration (MEC2), and Finite Element Method (MEC3)
- **Dynamic Systems and Control (DSC):** Dynamic Systems (DSC1); Mechanical Vibrations (DSC2); and Control Systems (DSC3)
- **Thermofluids Science (TFS):** Thermodynamics (TFS1); Fluid Mechanics (TFS2); and Heat Transfer (TFS3)

Sample Exams B for Mechanical Engineering PhD Students (select one Exam B):

- Control Systems (DSC3)
- Dynamic Systems (DSC1)
- Dynamics and Vibration (MEC2)
- Engineering Mathematics (MTH)
- Finite Element Method (MEC3)
- Fluid Mechanics (TFS2)
- Heat Transfer (TFS3)
- Kinetics of Materials (MSE1)
- Mechanics of Deformable Media (MEC1)
- Process, Structure, Property, and Performance of Materials (MSE3)
- Thermodynamics (TFS1)
- Thermodynamics of Materials (MSE2)

Oral Examination

The objective of the oral exam is to assess a student's potential to perform independent research in the chosen field of specialization. This exam shall be administered no later than the end of the semester in which the written exams are taken and passed. The exam shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate.

Oral examination procedure: The student's research advisor convenes and chairs an oral examination committee comprised of a minimum of three faculty members deemed appropriate by the research advisor. This committee provides a set of technical papers pertinent to the student's research area at least one month before the examination. The oral examination committee will then conduct the exam that comprises the following two parts (both completed in a one-hour session):

1. A 30-minute oral presentation on a selected number of papers out of the assigned technical papers
2. A 30-minute oral exam by committee members' questions and evaluation of the student covering topics specifically related to the student's research area

Grading Procedure

Grading procedure and results of the written comprehensive examination: The MIE Graduate Affairs Committee will review all students' performance in the written comprehensive exams. Depending on the results of both major and minor exams and in consultation with the student's research advisor, the Graduate Affairs Committee will recommend one of the following three possible options:

1. *No invitation to oral exam:* The student will be dismissed from the program. He or she may be granted a master' degree if the requirements are already met; otherwise, the student may continue to fulfill the requirements for a master's degree in industrial engineering (IE), mechanical engineering (ME), or operations research (OR).
2. *No invitation to oral exam yet:* The student will be asked to retake the written exam(s) again in the next offering; and/or take additional courses.
3. *Student is invited to oral exam.*

The Graduate Affairs Committee makes its final recommendation considering all aspects of the exam including, but not limited to, examiners' reports and results, student's research performance, and course work. The Graduate Affairs Committee reserves the right to recommend option 1 above for students who register for the exams but do not show up.

Grading procedure and results of the oral examination: If the student's performance in the oral exam is not satisfactory, the student will be dismissed from the program. He or she may be granted a master's degree if the requirements are met; otherwise, the student may continue to fulfill the requirements for a master's degree in industrial engineering (IE), mechanical engineering (ME), or operations research (OR).

Upon successfully passing the oral exam, the student continues in the PhD program. Upon passing all the required course work, he or she will become a PhD candidate. The results of written and oral exams and any recommended course work will become part of the student's record.

Appeal Procedure

The preliminary qualifying examination process provides means for reevaluation for students who fail one or more exams to appeal the Graduate Affairs Committee decision. All communications related to these examinations should be coordinated through the student's research advisor. Only the student's research advisor may request the MIE Graduate Affairs Committee to reevaluate the student's failed exams using the appeal form found at the link (http://www.coe.neu.edu/sites/default/files/pdfs/coe/gse/miepetitionform.pdf).

PhD Students Changing Their Program

PhD students who, for any reason, decide to change their degree program (i.e., from PhD in ME to PhD in IE or vice versa) must take (or retake) the doctoral qualifying examinations (both written comprehensive exams and oral exam) based on the student's new major research area (i.e., industrial engineering, materials, mechanics, mechatronics, or thermofluids).

Interdisciplinary PhD Students with MIE as the Home Department

Students pursuing a College of Engineering interdisciplinary PhD program with the MIE department as their home department must take one of the major written comprehensive exams (exam A) of the MIE doctoral qualifying examinations. The minor exam (exam B) can be substituted with appropriate exam(s) from other department(s) involved with the student's interdisciplinary PhD program.

Dissertation Proposal Preparation and Presentation Timing

Students must present their dissertation proposal no more than 12 months after successfully completing the oral exam. In addition, the presentation of the dissertation proposal and the actual dissertation defense (see below) shall be no less than 6 months apart. The student's dissertation committee will invite any additional faculty deemed appropriate to that field; this dissertation committee will then conduct the dissertation proposal session. Each student's dissertation committee

must be comprised of at least three members, including the research advisor. At least two of those three members must be full-time MIE faculty members.

Dissertation Course Requirements

Upon successful completion of the doctoral qualifying examinations (both written preliminary and oral exams) as well as all the required course work, the doctoral candidate, in consultation with his or her research advisor, must register in two consecutive semesters (may include full summer term) for Dissertation (ME 9990). Upon completion of this sequence, the student must then register for Dissertation Continuation (ME 9996) in every semester (in each fall and spring term and also in the summer term if summer is the student's last semester) until the dissertation is completed. Students may not register for Dissertation Continuation (ME 9996) until they fulfill the two-semester sequence of Dissertation (ME 9990).

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Candidacy Preparation—Doctoral (ME 8960), can be taken if needed to fulfill the full-time course registration requirement. Candidacy Preparation—Doctoral (ME 8960) is an individual instruction course, billed as one semester hour, and graded S or U. Candidacy Preparation—Doctoral (ME 8960) does not have any course content, and students must register in a section for which their research or academic advisor is listed as the "instructor."

Final Oral (Dissertation Defense) Examination

All doctoral candidates must pass a final oral exam. This exam will be scheduled once the dissertation committee agrees that the candidate's research is at a stage where it is appropriate for formal presentation and after completion of all other PhD requirements, including all the course work approved in the final program of study. The objective of the exam is for the candidate to present and defend the results of the dissertation research and to demonstrate depth of knowledge and significant expertise in the area of that research under questioning from the dissertation committee and other attendees.

The exam shall be publicly advertised at least one week in advance and all faculty members may attend and participate. At the conclusion of the presentation and subsequent questions period, the dissertation committee will convene to determine the outcome. The committee may recommend that the candidate be awarded the PhD or may require additional research and/or modifications of the dissertation. In some cases, candidates may be asked to present an additional final oral dissertation defense.

Residency Requirement

After achieving PhD candidacy, the university residency requirement is satisfied by two semesters of full-time graduate registration or four semesters of part-time graduate registration. Students must be continually enrolled during the pursuit of dissertation.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Doctoral qualifying exams (both written comprehensive and oral area exams)
Annual review
Dissertation committee formation
Dissertation proposal
Dissertation defense

General Requirements

Seminars		
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Approved Course Work		
Requires 48 semester hours of course work, including up to 4 semester hours of Independent Study (ME 7978). Students who choose to get an MS degree along the way to PhD, must complete a total of 56 semester hours (32 semester hours toward the sought MS degree and 24 semester hours beyond the earned MS degree). The 32 semester hours applied toward the MS degree may include up to 8 semester hours of MS Project or approved independent study course work. Please consult your faculty advisor for acceptable courses.		48

Dissertation Courses

Complete the following (repeatable) course twice. Must register in two consecutive semesters (may include full summer term):

ME 9990	Dissertation

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.000 GPA required

Mechanical Engineering, PhD—Advanced Entry

Requirements

The PhD is awarded to students who demonstrate high academic achievement and research competence in the fields of mechanical engineering. To earn a PhD, a student must complete an approved, rigorous program of advanced course work and submit and defend an original dissertation of independent research. The Department of Mechanical and Industrial Engineering (MIE) expects all successful doctoral candidates to show depth of knowledge and research innovation in their chosen field of specialization.

The MIE department admits applicants to the PhD program either directly after earning a suitable bachelor's degree (i.e., direct entry) or after earning a master's degree (i.e., advanced entry). Upon acceptance into the program, an applicant is designated as a doctoral student. This designation is changed to doctoral candidate upon successful completion of the doctoral qualifying examinations (both written and oral area exams) as well as all the required course work.

Academic and Research Advisors

PhD students must find a research advisor within their first year of study. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Students are advised by the academic advisor of their discipline before they select their research advisor(s).

Change of Research Advisor

Students who wish to change their research advisor need to use the MIE petition form to make that request. The petition form must be signed by

the student and by the student's current and future research advisor. The signed petition form should then be submitted to the MIE department for further processing.

Course Requirements and Plan of Study

A typical program of study includes at least 24 semester hours of course work beyond the master's degree. All MIE PhD students must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during their first year of full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. The outcome of online session will be filed with the student's records.

Each doctoral student, together with his or her research advisor, should develop an initial program during the first semester of study. The final program is also subject to the approval of the area examining committee, who will add the program of study to the student's record upon admission to doctoral candidacy.

Students may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour Independent Study (ME 7978) as part of their required course work. An independent study must be approved by the research advisor.

PhD Candidacy

To qualify as a doctoral candidate, a doctoral student must successfully complete the doctoral qualifying examinations (both a written comprehensive exam and an oral exam—see below) as well as all the required course work.

Doctoral Qualifying Examinations

Background and motivation: To demonstrate breadth and depth in each of the subject exams, crossover and merging exams are necessary in an effort to provide students with an opportunity to master the core disciplines in mechanical or industrial engineering (at both undergraduate and graduate levels) along with a focus area of importance to their specialization. These exams also provide an assessment as to whether students have adequate knowledge to pursue advanced study and possess attributes of a doctoral candidate by demonstrating understanding of and the ability to apply fundamental principles. Also, an oral exam tied to the written exams is necessary in an effort to evaluate a student's potential to perform independent research in the chosen field of specialization for the doctoral program.

Doctoral qualifying examinations framework: The doctoral qualifying examinations consist of the following two parts:

1. Two ***written comprehensive*** exams, which are respectively referred to as exam A and exam B
2. An ***oral*** exam to be administered no later than the end of the semester in which the written exams are taken and passed

Written Comprehensive Examinations

All doctoral students admitted directly with a bachelor's degree must take the written comprehensive exams no later than the first time that it is offered after their first two years of study. The written comprehensive exams include two exams, **exam A** and **exam B,** and are given on Thursday and Friday of the first week of classes during regular semesters. A complete list of these exams along with topical coverage and details are provided on the MIE department graduate website (http://www.mie.neu.edu/mie/degrees-programs/graduate-studies). Students should also consult extensively with their research advisor regarding all aspects of the qualifying exams.

Written Comprehensive Exams Rules

Exam A, about four to six hours in length, should be selected from the list of major exams based on the student's concentration (i.e., materials, mechanics, mechatronics, or thermofluids, see below). No deviation from this rule will be permitted. As listed below, exam B, about one to two hours in length, should be selected from the list of exams B for PhD degree program in industrial engineering (see below). Only one exam from this list should be selected. All students are required to have their research advisor's approval on selection of exam B prior to registering to take the written comprehensive exams. Note that exam B cannot be similar or close to one of the topics covered in exam A.

List of exams A and B based on student's research concentration:

Exams A for Mechanical Engineering PhD Students (select one Exam A):

- **Materials Science Engineering (MSE):** Kinetics of Materials (MSE1), Thermodynamics of Materials (MSE2); and Process, Structure, Property, and Performance of Materials (MSE3)
- **Mechanics (MEC)**: Mechanics of Deformable Media (MEC1), Dynamics and Vibration (MEC2), and Finite Element Method (MEC3)
- **Dynamic Systems and Control (DSC):** Dynamic Systems (DSC1); Mechanical Vibrations (DSC2); and Control Systems (DSC3)
- **Thermofluids Science (TFS):** Thermodynamics (TFS1); Fluid Mechanics (TFS2); and Heat Transfer (TFS3)

Sample Exams B for Mechanical Engineering PhD Students (select one Exam B):

- Control Systems (DSC3)
- Dynamic Systems (DSC1)
- Dynamics and Vibration (MEC2)
- Engineering Mathematics (MTH)
- Finite Element Method (MEC3)
- Fluid Mechanics (TFS2)
- Heat Transfer (TFS3)
- Kinetics of Materials (MSE1)
- Mechanics of Deformable Media (MEC1)
- Process, Structure, Property, and Performance of Materials (MSE3)
- Thermodynamics (TFS1)
- Thermodynamics of Materials (MSE2)

Oral Examination

The objective of the oral exam is to assess a student's potential to perform independent research in the chosen field of specialization.This exam shall be administered no later than the end of the semester in which the written exams are taken and passed. The exam shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate.

Oral examination procedure: The student's research advisor convenes and chairs an oral examination committee comprised of a minimum of three faculty members deemed appropriate by the research advisor. This committee provides a set of technical papers pertinent to the student's research area at least one month before the examination. The oral examination committee will then conduct the exam that comprises the following two parts (both completed in a one-hour session):

1. A 30-minute oral presentation on a selected number of papers out of the assigned technical papers

2. A 30-minute oral exam by committee members' questions and evaluation of the student covering topics specifically related to the student's research area

Grading Procedure

Grading procedure and results of the written comprehensive examination: The MIE Graduate Affairs Committee will review all students' performance in the written comprehensive exams. Depending on the results of both major and minor exams and in consultation with the student's research advisor, the Graduate Affairs Committee will recommend one of the following three possible options:

1. *No invitation to oral exam:* The student will be dismissed from the program. He or she may be granted a master's degree if the requirements are already met; otherwise, the student may continue to fulfill the requirements for a master's degree in industrial engineering (IE), mechanical engineering (ME), or operations research (OR).
2. *No invitation to oral exam yet:* The student will be asked to retake the written exam(s) again in the next offering; and/or take additional courses.
3. *Student is invited to oral exam.*

The Graduate Affairs Committee makes its final recommendation considering all aspects of the exam including, but not limited to, examiners' reports and results, student's research performance, and course work. The Graduate Affairs committee reserves the right to recommend option 1 above for students who register for the exams but do not show up.

Grading procedure and results of the oral examination: If the student's performance in the oral exam is not satisfactory, the student will be dismissed from the program. He or she may be granted a master's degree if the requirements are met; otherwise, the student may continue to fulfill the requirements for a master's degree in industrial engineering (IE), mechanical engineering (ME), or operations research (OR).

Upon successfully passing the oral exam, the student continues in the PhD program and upon passing all the required course work, he or she will become a PhD candidate. The results of written and oral exams and any recommended course work will become part of the student's record.

Appeal Procedure

The preliminary qualifying examination process provides means for reevaluation for students who fail one or more exams to appeal the Graduate Affairs Committee decision. All communications related to these examinations should be coordinated through the student's research advisor. Only the student's research advisor may request the MIE Graduate Affairs Committee to reevaluate the student's failed exams using the appeal form found at the link (http://www.coe.neu.edu/sites/default/files/pdfs/coe/gse/miepetitionform.pdf).

PhD Students Changing Their Program

PhD students who, for any reason, decide to change their program (i.e., from PhD in ME to PhD in IE or vice versa) must take (or retake) the doctoral qualifying examinations (both written comprehensive exams and oral exam) based on the student's new major research area (i.e., industrial engineering, materials, mechanics, mechatronics, or thermofluids).

Interdisciplinary PhD Students with MIE as the Home Department

Students pursuing a College of Engineering interdisciplinary PhD program with the MIE department as their home department, must take one of the major written comprehensive exams (exam A) of the MIE doctoral qualifying examinations. The minor exam (exam B) can be substituted with appropriate exam(s) from other department(s) involved with the student's interdisciplinary PhD program.

Dissertation Proposal Preparation and Presentation Timing

Students must present their dissertation proposal no more than 12 months after successfully completing the oral exam. In addition, the presentation of the dissertation proposal and the actual dissertation defense (see below) shall be no less than 6 months apart. The student's dissertation committee will invite any additional faculty deemed appropriate to that field; this dissertation committee will then conduct the dissertation proposal session. Each student's dissertation committee must be comprised of at least three members, including the research advisor. At least two of those three members must be full-time MIE faculty members.

Dissertation Course Requirements

Upon successful completion of the doctoral qualifying examinations (both written preliminary and oral exams) as well as all the required course work, the doctoral candidate, in consultation with his or her research advisor, must register in two consecutive semesters (may include full summer term) for Dissertation (ME 9990). Upon completion of this sequence, the student must then register for Dissertation Continuation (ME 9996) in every semester (in each fall and spring term and also in the summer term if summer is the student's last semester) until the dissertation is completed. Students may not register for Dissertation Continuation (ME 9996) until they fulfill the two-semester Dissertation (ME 9990) registration sequence.

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Candidacy Preparation—Doctoral (ME 8960), can be taken if needed to meet full-time course registration requirements. This course is an individual instruction course, billed at 1 semester hour, and graded as S or U. Candidacy Preparation—Doctoral (ME 8960) does not have any course content, and students must register in a section for which their research or academic advisor is listed as the "instructor" in the online course registration system.

Final Oral (Dissertation Defense) Examination

All doctoral candidates must pass a final oral exam. This exam will be scheduled once the dissertation committee agrees that the candidate's research is at a stage where it is appropriate for formal presentation and after completion of all other requirements for the PhD, including all course work approved in the final program of study. The objective of the exam is for the candidate to present and defend the results of the dissertation research and to demonstrate depth of knowledge and significant expertise in the area of that research under questioning from the dissertation committee and other attendees.

The exam shall be publicly advertised at least one week in advance and all faculty members may attend and participate. At the conclusion of the presentation and subsequent questions period, the dissertation committee will convene to determine the outcome. The committee may recommend that the candidate be awarded the PhD or may require additional research and/or modifications of the dissertation. In some cases, candidates may be asked to present an additional final oral dissertation defense.

Residency Requirement

After achieving PhD candidacy, the university residency requirement is satisfied by two semesters of full-time graduate registration or four semesters of part-time graduate registration. Students must be continually enrolled during the pursuit of their dissertation.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Doctoral qualifying exams (both written comprehensive and oral area exams)
Annual review
Dissertation committee formation
Dissertation proposal
Dissertation defense

General Requirements

Seminars		
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Approved Course Work		
Requires 24 semester hours of course work, including up to 4 semester hours of Independent Study (ME 7978). Please consult your faculty advisor for acceptable courses.		24

Dissertation Courses

Complete the following (repeatable) course twice. Must register in two consecutive semesters (may include full summer term):

ME 9990	Dissertation

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Data Analytics Engineering, MS

The Department of Mechanical and Industrial Engineering (MIE) offers the Master of Science in Data Analytics Engineering in order to meet the current and projected demand for a workforce trained in analytics. This degree program offers students an opportunity to train for industry jobs or to acquire rigorous analytical skills and research experience to prepare for a doctoral program in health, security, and sustainability at Northeastern University. While the core courses for this program are offered by the College of Engineering, elective courses can be chosen from diverse disciplines spread across various colleges at Northeastern. The MS degree in data analytics engineering is designed to enable the graduating students to address the growing need for professionals who are trained in advanced data analytics and can transform large streams of data into understandable and actionable information for the purpose of making decisions. The key sectors that require analytics professionals include healthcare, smart manufacturing, supply chain and logistics, national security, defense, banking, finance, marketing, and human resources.

The Master of Science in Data Analytics Engineering is designed to help students acquire knowledge and skills to:

- Discover opportunities to improve systems, processes, and enterprises through data analytics
- Apply optimization, statistical, and machine-learning methods to solve complex problems involving large data from multiple sources
- Collect and store data from a variety of sources, including Internet of Things (IoT), an integrated network of devices and sensors, customer touch points, processes, social media, and people
- Work with technology teams to design and build large and complex SQL databases
- Use tools and methods for data mining, big-data algorithms, and data visualization to generate reports for analysis and decision making
- Create integrated views of data collected from multiple sources of an enterprise
- Understand and explain results of data analytics to decision makers
- Design and develop analytics projects

This degree program seeks to prepare students for a comprehensive list of tasks including collecting, storing, processing, and analyzing data; reporting statistics and patterns; drawing conclusions and insights; and making actionable recommendations.

General Degree Requirements

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science degree in engineering, science, mathematics, or an equivalent field. Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Students can complete a master's degree by pursuing any of one of the three tracks: course work option, project option, and thesis option. Specific degree requirements for each of these tracks can be found under the Program Requirements tab. Students may pursue any master's program either on a full-time or part-time basis; however, certain restrictions may apply.

Specific Degree Requirements

Core courses for the MS in data analytics engineering provide students with a foundation in operations research, statistics, data and knowledge engineering, and visualization. Students can select electives from a wide range of fields including business, engineering, healthcare, manufacturing, and urban communities/cities. These courses are designed to provide students with a strong understanding of probability and statistics, optimization methods, data mining, database design, and visualization. Elective courses provide students with the knowledge and understanding of descriptive, prescriptive, diagnostic, and predictive analytics as applied to a specific field of interest such as business, healthcare, manufacturing, and urban communities/cities. Alternatively, students can select their electives so that they can prepare for a doctoral program by taking advanced courses in mathematics, statistics, machine learning, and pattern recognition.

Special Course Requirements

All MIE MS students doing thesis or project options (excluding MS students in engineering management and Gordon Engineering Leadership programs) must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during the first year of their full-time study. If appropriate, part-time students may petition the graduate affairs committee to waive these requirements. Students in combined BS/MS programs pursuing thesis or project options must take Research Seminar in Mechanical and Industrial Engineering (MEIE 6850) as part of their course work requirement, while Research Seminar in Mechanical and Industrial Engineering (MEIE 6850) is optional for these students.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one

of these courses. Outcome of the online session will be filed with the student's records

Academic and Research Advisors

All nonthesis students are advised by the academic advisor designated for their respective concentration or program. Students doing thesis option must find a research advisor within their first year of study and may have thesis reader(s) at the discretion of their research advisor. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE graduate affairs committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Thesis option students are advised by the academic advisor designated for their concentration before they select their research advisor(s).

Plan of Study and Course Selection

It is recommended that all new students attend orientation sessions held by the MIE department and the Graduate School of Engineering to acquaint themselves with the course work requirements and research activities of the department as well as with the general policies, procedures, and expectations.

In order to receive proper guidance with their course work needs, all MS students are strongly encouraged to complete and submit a fully signed Plan of Study (PS) to the department before enrolling in second-semester courses. This form helps the students manage their course work as well as helps the department to plan for requested course offerings. The PS may be modified at any time as students progress in their degree programs. However, requests for changes in the PS must be processed before the requested change actually takes place. A revised PS form must also be approved and signed.

Each student's academic advisor must approve all courses prior to registration. Students may only use courses taken with the approval of the academic advisor toward the 32-semester-hour minimum requirement. However, students may petition the MIE graduate affairs committee to substitute graduate-level courses from outside the approved list of electives.

Students pursuing study or research under the guidance of a faculty member can choose the project option by taking Master's Project (ME 7945). An MS project must be petitioned to the MIE graduate affairs committee and approved by both the faculty member (instructor for Master's Project) and the student's academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme.

Students doing the course work option may petition the MIE graduate affairs committee to substitute up to a 4-semester-hour Independent Study (ME 7978). An independent study must be approved by the academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme. Students in other options (i.e., thesis or project) are not eligible to take independent study.

Options for MS Students (course work only, project, or thesis)

Students accepted into any of the MS programs in the MIE department can choose one of the three options: course work only, project, research project or MS thesis. Moreover, students who receive financial support from the university in the form of a research, teaching, or tuition assistantship must complete an 8-semester-hour thesis.

Students who complete the thesis option must make a presentation of their thesis before approval by the department. The MS thesis presentation shall be publicly advertised at least one week in advance, and all faculty members and students may attend and participate. If deemed appropriate by the research advisor, other faculty members may be invited to serve as "thesis readers" to provide technical opinions and judge the quality of the thesis and presentation.

Change of Program/Concentration

Students enrolled in any of the MIE department programs or concentrations may change their current program or concentration no sooner than the end of their first full-time semester of study. In order for the program or concentration change request to be considered by the MIE graduate affairs committee, the student must be in good academic standing and have completed at least 8 semester hours of course work at Northeastern. See here (p. 112) for instructions on how to request a program or concentration change.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Data Analytics Engineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Data Analytics Engineering in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 40-semester-hour degree and certificate will require 24 hours of advisor-approved data analytics technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

EECE 5642	Data Visualization	4
IE 6200	Engineering Probability and Statistics	4
IE 7275	Data Mining in Engineering	4
IE 7280	Statistical Methods in Engineering	4
INFO 6210	Data Management and Database Design	4
OR 6205	Deterministic Operations Research	4

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 8 semester hours from the course list below.		8

PROJECT OPTION

ME 7945	Master's Project	4
Complete 4 semester hours from the course list below.		4

THESIS OPTION

ME 7990	Thesis [1]	8

Course List

Bouvé College of Health Sciences Electives	
HINF 5102	Data Management in Healthcare
HINF 6220	Database Design, Access, Modeling, and Security
College of Computer and Information Science Electives	
CS 6140	Machine Learning
CS 6200	Information Retrieval
CS 6240	Large-Scale Parallel Data Processing
DA 5020	Collecting, Storing, and Retrieving Data
DA 5030	Introduction to Data Mining/Machine Learning
IA 5050	Data Mining in Cyberspace
College of Engineering Electives	
CIVE 7100	Applied Time Series and Spatial Statistics
CSYE 7200	Big-Data System Engineering Using Scala
CSYE 7245	Big-Data Systems and Intelligence Analytics
CSYE 7270	Building Virtual Environments
EECE 5644	Introduction to Machine Learning and Pattern Recognition
EECE 7313	Pattern Recognition
EECE 7397	Advanced Machine Learning
EMGT 5220	Engineering Project Management
IE 5630	Biosensor and Human Behavior Measurement
IE 7270	Intelligent Manufacturing
IE 7615	Neural Networks in Engineering
INFO 7250	Engineering of Big-Data Systems
INFO 7290	Data Warehousing and Business Intelligence
OR 7245	Network Analysis and Advanced Optimization
OR 7250	Multi-Criteria Decision Making
College of Science Electives	
MATH 7341	Probability 2
MATH 7342	Mathematical Statistics
MATH 7343	Applied Statistics
MATH 7344	Regression, ANOVA, and Design
PHYS 5116	Complex Networks and Applications
PHYS 7331	Network Science Data
College of Social Sciences and Humanities Electives	
PPUA 5262	Big Data for Cities
PPUA 7237	Advanced Spatial Analysis of Urban Systems
D'Amore-McKim School of Business Electives	
BUSN 6320	Business Analytics Fundamentals
BUSN 6324	Predictive Analytics for Managers
BUSN 6326	Introduction to Big Data and Digital Marketing Analytics

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

[1] A thesis is required for all students who receive financial support from the university in the form of a research, teaching, or tuition assistantship. The thesis topic should cover one or more of the areas from statistics, mathematics, optimization, data mining, machine learning, database design, big data, visualization tools, or forecasting methods. The thesis should train students for research in data and operations analytics and/or prepare them for a doctoral program.

Industrial Engineering, MSIE

The Department of Mechanical and Industrial Engineering (MIE) offers comprehensive research and educational programs for students pursuing the Master of Science (MS) in Industrial Engineering. These extensive programs and course work allow for the selection of a degree that meets a wide variety of personal and professional goals.

General Degree Requirements

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science degree in engineering, science, mathematics, or an equivalent field. Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Students can complete a master's degree by pursuing any of one of the three tracks: course work option, project option, and thesis option. Specific degree requirements for each of these tracks can be found under the Program Requirements tab. Also, students can complete their master's degree either on a full-time or part-time basis; however, certain restrictions may apply.

Special Course Requirements

All MS students in thesis or project options (excluding MS students in engineering management and Gordon Engineering Leadership programs) must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during the first year of their full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements. Students in combined BS/MS programs pursuing thesis or project options, must take Research Seminar in Mechanical and Industrial Engineering (MEIE 6850) as part of their course work requirement, while Technical Writing (MEIE 6800) is optional for these students.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. Outcome of the online session will be filed with the student's records.

Academic and Research Advisors

All nonthesis students (students doing course work or project options) are advised by the academic advisor designated for their respective concentration or program. Thesis option students must find a research advisor within their first year of study and may have thesis reader(s) at the discretion of their research advisor. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Thesis option

students are advised by the academic advisor designated for their concentration before they select their research advisor(s).

Plan of Study and Course Selection

It is recommended that all new students attend orientation sessions held by the MIE department and the Graduate School of Engineering to acquaint themselves with the course work requirements and research activities of the department as well as with the general policies, procedures, and expectations.

In order to receive proper guidance with their course work needs, all MS students are strongly encouraged to complete and submit a fully signed Plan of Study (PS) to the department before enrolling in second-semester courses. This form helps the students manage their course work as well as helps the department to plan for requested course offerings. The PS can be modified at any time as students progress in their degree programs. However, requests for changes in the PS must be processed before the requested change actually takes place. A revised PS form must also be approved and signed.

Each student's academic advisor must approve all courses prior to registration. Students may only use courses taken with the approval of the academic advisor toward the 32-semester-hour minimum requirement. However, students may petition the MIE Graduate Affairs Committee to substitute graduate-level courses from outside the approved list of electives.

Students pursuing study or research under the guidance of a faculty member can elect the project option by taking Master's Project (IE 7945). An MS project must be petitioned to the MIE Graduate Affairs Committee and approved by both the faculty member (instructor for MS Project) and the student's academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme.

Students doing the course work option may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour Independent Study (IE 7978). An independent study must be approved by the academic advisor. The petition must clearly state the reason for taking the course; a brief description of goals; as well as the expected outcomes, deliverables, and grading scheme. Students in other options (i.e., thesis or project) are not eligible to take independent study.

Options for MS Students (course work only, project, or thesis)

Students accepted into any of the MS programs in the MIE department can choose one of the three options: course work only, project, or thesis. Please see the "Program Requirements" tab on the top menu of this page for more information. MS students who want to pursue project or thesis options must find within their first year of study a faculty member or a research advisor who will be willing to direct and supervise a mutually agreed research project or MS thesis. Moreover, students who receive financial support from the university in the form of a research, teaching, or tuition assistantship must complete an 8-semester-hour thesis.

Students who complete the thesis option must make a presentation of their thesis before approval by the department. The MS thesis presentation shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate. If deemed appropriate by the research advisor, other faculty members may be invited to serve as "thesis readers" to provide technical opinions and judge the quality of the thesis and presentation.

Change of Program/Concentration

Students enrolled in any of the MIE department programs or concentrations may change their current program or concentration no sooner than the end of their first full-time semester of study. In order for the program or concentration change request to be considered by the MIE Graduate Affairs Committee, the student must be in good academic standing and have completed at least 8 semester hours of course work at Northeastern. See here (p. 112) for instructions on how to request a program or concentration change.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Industrial Engineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Industrial Engineering in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved industrial engineering technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

IE 6200	Engineering Probability and Statistics	4
OR 6205	Deterministic Operations Research	4
Complete 8 semester hours from the following:		8
IE 5400	Healthcare Systems Modeling and Analysis	
IE 7200	Supply Chain Engineering	
IE 7215	Simulation Analysis	
IE 7315	Human Factors Engineering	
IE 7275	Data Mining in Engineering	

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 16 semester hours from the course list below.		16
Note: Other approved courses may be chosen in consultation with a faculty advisor.		

PROJECT OPTION

IE 7945	Master's Project	4
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Complete 12 semester hours from the course list below.		12

Note: Other approved courses may be chosen in consultation with a faculty advisor.

THESIS OPTION

IE 7990	Thesis (required for all students who receive financial support from the university in the form of a research, teaching, or tuition assistantship)	8
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Complete 8 semester hours from the course list below.		8

Note: Other approved courses may be chosen in consultation with a faculty advisor.

Course List

CSYE 6200	Concepts of Object-Oriented Design
CSYE 6205	Concepts of Object-Oriented Design with C++
CSYE 6210	Component Software Development
CSYE 6220	Enterprise Software Design
CSYE 7230	Software Engineering
CSYE 7270	Building Virtual Environments
CSYE 7280	User Experience Design and Testing
GE 5010	Customer-Driven Technical Innovation for Engineers
GE 5100	Product Development for Engineers
EMGT 5220	Engineering Project Management
EMGT 5300	Engineering/Organizational Psychology
EMGT 6225	Economic Decision Making
EMGT 6305	Financial Management for Engineers
IE 5617	Lean Concepts and Applications
IE 5620	Mass Customization
IE 5630	Biosensor and Human Behavior Measurement
IE 6300	Manufacturing Methods and Processes
IE 7255	Manufacturing Processes
IE 7270	Intelligent Manufacturing
IE 7275	Data Mining in Engineering
IE 7280	Statistical Methods in Engineering
IE 7285	Statistical Quality Control
IE 7290	Reliability Analysis and Risk Assessment
IE 7315	Human Factors Engineering
OR 7230	Probabilistic Operation Research
OR 7235	Inventory Theory
OR 7240	Integer and Nonlinear Optimization
OR 7245	Network Analysis and Advanced Optimization
OR 7250	Multi-Criteria Decision Making
OR 7260	Constraint Programming
OR 7310	Logistics, Warehousing, and Scheduling

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Mechanical Engineering with Concentration in General Mechanical Engineering, MSME

While pursuing a Master of Science (MS) in Mechanical Engineering, students may choose no concentration or what is referred to as general mechanical engineering.

General Degree Requirements

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science degree in engineering, science, mathematics, or an equivalent field. Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Students can complete a master's degree by pursuing any of one of the three tracks: course work option, project option, and thesis option. Specific degree requirements for each of these tracks can be found under the "Program Requirements" tab. Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

Special Course Requirements

All mechanical and industrial engineering (MIE) MS students in thesis or project options (excluding MS students in engineering management and Gordon Engineering Leadership programs) must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during the first year of their full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements. Students in combined BS/MS programs pursuing thesis or project options must take Research Seminar in Mechanical and Industrial Engineering (MEIE 6850) as part of their course work requirement, while Technical Writing (MEIE 6800) is optional for these students.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. Outcome of the online session will be filed with the student's records.

Academic and Research Advisors

All nonthesis students are advised by the academic advisor designated for their respective concentration or program. MS students doing thesis option must find a research advisor within their first year of study and may have thesis reader(s) at the discretion of their research advisor. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as co-advisor. Thesis option students are advised by the academic advisor of their concentration before they select their research advisor(s).

Plan of Study and Course Selection

It is recommended that all new students attend orientation sessions held by the MIE department and the Graduate School of Engineering to acquaint themselves with the course work requirements and research activities of the department as well as with the general policies, procedures, and expectations.

In order to receive proper guidance with their course work needs, all MS students are strongly encouraged to complete and submit a fully signed Plan of Study (PS) to the department before enrolling in second-semester courses. This form helps the students manage their course work as

well as helps the department to plan for requested course offerings. The PS form may be modified at any time as the students progress in their degree programs. However, requests for changes in the PS must be processed before the requested change actually takes place. A revised PS form must also be approved and signed.

Each student's academic advisor must approve all courses prior to registration. Students may only use courses taken with the approval of their academic advisor toward the 32-semester-hour minimum requirement. However, students may petition the MIE Graduate Affairs Committee to substitute graduate-level courses from outside the approved list of electives.

Students pursuing study or research under the guidance of a faculty member can choose project option by taking Master's Project (ME 7945). An MS project must be petitioned to the MIE Graduate Affairs Committee and approved by both the faculty member (instructor for Master's Project) and the student's academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme.

Students doing course work option may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour Independent Study (ME 7978). An independent study must be approved by the academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme. Students in other options (i.e., thesis or project) are not eligible to take independent study.

Options for MS Students (course work only, project, or thesis)

Students accepted into any of the MS programs in the MIE department can choose one of the three options: coursework only, project, or thesis. Please see the "Program Requirements" tab on the top menu of this page for more information. MS students who want to pursue project or thesis options must find, within the first year of their study, a faculty member or a research advisor who will be willing to direct and supervise a mutually agreed research project or MS thesis. Moreover, students who receive financial support from the university in the form of a research, teaching, or tuition assistantship must complete an 8-semester-hour thesis.

Students who complete the thesis option must make a presentation of their thesis before approval by the department. The MS thesis presentation shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate. If deemed appropriate by the research advisor, other faculty members may be invited to serve as thesis readers to provide technical opinions and judge the quality of the thesis and presentation.

Change of Program/Concentration

Students enrolled in any of the MIE department programs or concentrations may change their current program or concentration no sooner than the end of their first full-time semester of study. In order for the program or concentration change request to be considered by the MIE Graduate Affairs Committee, the student must be in good academic standing and have completed at least 8 semester hours of course work at Northeastern. See here (p. 112) for instructions on how to request a program or concentration change.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Mechanical Engineering with a Concentration in General Mechanical Engineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Mechanical Engineering with a Concentration in General Mechanical Engineering in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved mechanical engineering technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Mathematics Competency		
Complete 4 semester hours from the following:		4
ME 6200	Mathematical Methods for Mechanical Engineers 1	
ME 6201	Mathematical Methods for Mechanical Engineers 2	
Thermofluids Competency		
Complete 4 semester hours from the following:		4
ME 5685	Solar Thermal Engineering	
ME 5690	Gas Turbine Combustion	
ME 5695	Aerodynamics	
ME 7280	Statistical Thermodynamics	
ME 7295	Multiscale Flow and Transport Phenomena	
ME 7300	Combustion and Air Pollution	
ME 7305	Fundamentals of Combustion	
ME 7310	Computational Fluid Dynamics with Heat Transfer	
ME 7330	Turbulent Flow	
ME 7340	Turbomachinery Design	
Mechanics/Mechatronics Combined Competency		
Complete 4 semester hours from the following:		4
EECE 5610	Digital Control Systems	
EECE 5666	Digital Signal Processing	
ME 5245	Mechatronic Systems	
ME 5650	Advanced Mechanics of Materials	
ME 5655	Dynamics and Mechanical Vibration	
ME 5657	Finite Element Method	
ME 5659	Control Systems Engineering	
ME 7210	Elasticity and Plasticity	
Materials Competency		
Complete 4 semester hours from the following:		4

ME 5600	Materials Processing and Process Selection	
ME 5645	Environmental Issues in Manufacturing and Product Use	
MATL		

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 16 semester hours in the following subject areas:		16
ME, MATL, or other graduate engineering courses		

PROJECT OPTION

ME 7945	Master's Project	4
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Electives		
Complete 12 semester hours in the following subject areas:		12
ME, MATL, or other graduate engineering courses		

THESIS OPTION

ME 7990	Thesis (required for all students who receive financial support from the university in the form of a research, teaching, or tuition assistantship)	8
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Electives		
Complete 8 semester hours in the following subject areas:		8
ME, MATL, or other graduate engineering courses		

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Mechanical Engineering with Concentration in Material Science, MSME

While pursuing a Master of Science (MS) in Mechanical Engineering, students may choose material science as a concentration. Material science has been the key enabler in virtually all engineering breakthroughs that have occurred from early metal ages to the present nano age. In step with the scientific development and discovery of materials, members of the mechanical and industrial engineering (MIE) faculty are involved in interdisciplinary research to further materials processing, synthesis, and design. Research areas are aligned with Northeastern University's broad initiatives of sustainability, security, and health, as well as national initiatives in manufacturing and nanotechnology. Investigations in the areas of metals/alloys, polymers, biomaterials (including biomimetics), and composites incorporating nanoscale materials make use of experimental, theoretical, and computational techniques to tailor structure-processing-property relationships in materials for specific applications. Current areas of research include controlling synthesis and assembly processes to produce well-defined atomic structures; defect engineering; manipulating atomic/microstructures and the chemistry of materials to optimize properties for next-generation structural, electronic, and energy applications; solidification and deformation processing; and life-cycle assessments for nanocomposites/materials. Northeastern faculty and students are committed to creative thinking and engineering innovation to propel materials development to the forefront of scientific research.

General Degree Requirements

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science degree in engineering, science, mathematics, or an equivalent field. Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Students can complete a master's degree by pursuing any of one of the three tracks: course work option, project option, and thesis option. Specific degree requirements for each of these tracks can be found under the "Program Requirements" tab. Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

Special Course Requirements

All MIE MS students in thesis or project options (excluding students doing MS in engineering management and Gordon Engineering Leadership programs) must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during the first year of their full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements. Students in combined BS/MS programs pursuing thesis or project options must take Research Seminar in Mechanical and Industrial Engineering (MEIE 6850) as part of their course work requirement, while Technical Writing (MEIE 6800) is optional for these students.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. Outcome of the online session will be filed with the student's records.

Academic and Research Advisors

All nonthesis students (students doing project or course work options) are advised by the academic advisor designated for their respective concentration or program. MS students doing a thesis option must find a research advisor within their first year of study and may have thesis reader(s) at the discretion of their research advisor. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Thesis option students are advised by the academic advisor designated for their specific concentration before they select their research advisor(s).

Plan of Study and Course Selection

It is recommended that all new students attend orientation sessions held by the MIE department and the Graduate School of Engineering to acquaint themselves with the course work requirements and research activities of the department as well as with the general policies, procedures, and expectations.

In order to receive proper guidance with their course work needs, all MS students are strongly encouraged to complete and submit a fully signed Plan of Study (PS) to the department before enrolling in second-semester courses. This form helps the students manage their course work as well as helps the department to plan for requested course offerings. The PS may be modified at any time as students progress in their degree programs. However, requests for changes in the PS must be processed

before the requested change actually takes place. A revised PS form must also be approved and signed.

Each student's academic advisor must approve all courses prior to registration. Students may only use courses taken with the approval of their academic advisor toward the 32-semester-hour minimum requirement. However, students may petition the MIE Graduate Affairs Committee to substitute graduate-level courses from outside the approved list of electives.

Students pursuing study or research under the guidance of a faculty member can elect for project option by taking Master's Project (MATL 7945). An MS project must be petitioned to the MIE Graduate Affairs Committee and approved by both faculty member (instructor) and the academic (concentration) advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme.

Students doing course work option may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour Independent Study (MATL 7978). An independent study must be approved by the academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme. Students in other options (i.e., thesis or project) are not eligible to take independent study.

Options for MS Students (course work only, project, or thesis)

Students accepted into any of the MS programs in the MIE department can choose one of the three options: course work only, project, or thesis. Please see the "Program Requirements" tab on the top menu of this page for more information. MS students who want to pursue project or thesis options must find, within their first year of study, a faculty member or a research advisor who will be willing to direct and supervise a mutually agreed research project or MS thesis. Moreover, students who receive financial support from the university in the form of a research, teaching, or tuition assistantship must complete an 8-semester-hour thesis.

Students who complete the thesis option must make a presentation of their thesis before approval by the department. The MS thesis presentation shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate. If deemed appropriate by the research advisor, other faculty members may be invited to serve as thesis readers to provide technical opinions and judge the quality of the thesis and presentation.

Change of Program/Concentration

Students enrolled in any of the MIE department programs or concentrations may change their current program or concentration no sooner than the end of their first full-time semester of study. In order for the program or concentration change request to be considered by the MIE Graduate Affairs Committee, the student must be in good academic standing and have completed at least 8 semester hours of course work at Northeastern. See here (p. 112) for instructions on how to request a program or concentration change.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Mechanical Engineering with a Concentration in Material Science with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Mechanical Engineering with a Concentration in Material Science in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved material science technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Complete 16 semester hours from the following:		16
MATL 6250	Soft Matter	
MATL 6285	Structure, Properties, and Processing of Polymeric Materials	
MATL 7350	Mechanical Behavior and Strengthening Mechanisms	
MATL 7355	Thermodynamics of Materials	
MATL 7360	Kinetics of Phase Transformations	
ME 5600	Materials Processing and Process Selection	
ME 5645	Environmental Issues in Manufacturing and Product Use	

Options

Complete one of the following options:

COURSE WORK OPTION

Electives		
Complete 16 semester hours in the following subject areas:		16
ME, MATL, or other graduate engineering courses		

PROJECT OPTION

MATL 7945	Master's Project	4
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Electives		
Complete 12 semester hours in the following subject areas:		12
ME, MATL, or other graduate engineering courses		

THESIS OPTION

ME 7990	Thesis [1]	8
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Electives		
Complete 8 semester hours in the following subject areas:		8
ME, MATL, or other graduate engineering courses		

Program Credit/GPA Requirements

32 total semester hours required

[1] Required for all students who receive financial support from the university in the form of a research, teaching, or tuition assistantship.

Mechanical Engineering with Concentration in Mechanics and Design, MSME

While pursuing a Master of Science (MS) in Mechanical Engineering, students may choose mechanics and design as a concentration. Advances in mechanics enable key engineering innovations. Using complementary computational, experimental, and design tools, the area of mechanics is addressing challenges from nanoscale actuators and human health to energy systems and bridges. For example, our biomechanics research is creating robotic rehabilitation aids and a new understanding of cellular biomechanics and the assembly and degradation of biomaterials. At the tiniest length scales, we are creating a new understanding of nanomechanics, contact mechanics, tribology, MEMS, and the application of nanomaterials for energy storage systems. Our research goals also include understanding, design, and creation of piezoactive sensors and actuators as well as the stability assessment and control of dynamical systems. Our research and teaching together are designed to prepare students to understand and exploit mechanics to enable their future engineering innovations.

General Degree Requirements

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science in engineering, science, mathematics, or an equivalent field. Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Students can complete a master's degree by pursuing any of one of the three tracks: course work option, project option, and thesis option. Specific degree requirements for each of these tracks can be found under the "Program Requirements" tab. Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

Special Course Requirements

All mechanical and industrial engineering (MIE) MS students in thesis or project options (excluding students doing MS in engineering management and Gordon Engineering Leadership programs) must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during the first year of their full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements. Students in combined BS/MS programs pursuing thesis or project options must take Research Seminar in Mechanical and Industrial Engineering (MEIE 6850) as part of their course work requirement, while Technical Writing (MEIE 6800) is optional for these students.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. Outcome of the online session will be filed with the student's records

Academic and Research Advisors

All nonthesis students (students doing course work or project options) are advised by the academic advisor designated for their respective concentration or program. MS students doing a thesis option must find a research advisor within their first year of study and may have thesis reader(s) at the discretion of their research advisor. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Thesis option students are advised by the academic advisor designated for their specific concentration before they select their research advisor(s).

Plan of Study and Course Selection

It is recommended that all new students attend orientation sessions held by the MIE department and the Graduate School of Engineering to acquaint themselves with the course work requirements and research activities of the department as well as with the general policies, procedures, and expectations.

In order to receive proper guidance with their course work needs, all MS students are strongly encouraged to complete and submit a fully signed Plan of Study (PS) to the department before enrolling in second-semester courses. This form helps the students manage their course work as well as helps the department to plan for requested course offerings. The PS may be modified at any time as students progress in their degree programs. However, requests for changes in the PS must be processed before the requested change actually takes place. A revised PS form must also be approved and signed.

Each student's academic advisor must approve all courses prior to registration. Students may only use courses taken with the approval of the academic advisor toward the 32-semester-hour minimum requirement. However, students may petition the MIE Graduate Affairs Committee to substitute graduate-level courses from outside the approved list of electives.

Students pursuing study or research under the guidance of a faculty member can elect for the project option by taking Master's Project (ME 7945). An MS project must be petitioned to the MIE Graduate Affairs Committee and approved by both the faculty member (instructor for Master's Project) and the student's academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme.

Students doing course work option may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour Independent Study (ME 7978). An independent study must be approved by the academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme. Students in other options (i.e., thesis or project) are not eligible to take independent study.

Options for MS Students (course work only, project, or thesis)

Students accepted into any of the MS programs in the MIE department can choose one of the three options; course work only, project, or thesis. Please see the "Program Requirements" tab on the top menu of this page for more information. MS students who want to pursue project or thesis options must find, within their first year of study, a faculty member or a research advisor who will be willing to direct and supervise a mutually agreed research project or MS thesis. Moreover, students who receive financial support from the university in the form of a research, teaching, or tuition assistantship must complete an 8-semester-hour thesis.

Students who complete thesis option must make a presentation of their thesis before approval by the department.The MS thesis presentation shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate. If deemed

appropriate by the research advisor, other faculty members may be invited to serve as thesis readers to provide technical opinions and judge the quality of the thesis and presentation.

Change of Program/Concentration

Students enrolled in any of the MIE department programs or concentrations may change their current program or concentration no sooner than the end of their first full-time semester of study. In order for the program or concentration change request to be considered by the MIE Graduate Affairs Committee, the student must be in good academic standing and have completed at least 8 semester hours of course work at Northeastern. See here (p. 112) for instructions on how to request a program or concentration change.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Mechanical Engineering with a Concentration in Mechanics and Design with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Mechanical Engineering with a Concentration in Mechanics and Design in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16 semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved mechanics and design technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Core		
Complete 4 semester hours from the following:		4
ME 6200	Mathematical Methods for Mechanical Engineers 1	
ME 6201	Mathematical Methods for Mechanical Engineers 2	
Mechanics		
Complete 12 semester hours from the following:		12
ME 5650	Advanced Mechanics of Materials	
ME 5655	Dynamics and Mechanical Vibration	
ME 5657	Finite Element Method	
ME 5659	Control Systems Engineering	
ME 7210	Elasticity and Plasticity	

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 16 semester hours in the following subject areas:		16
ME, MATL, or other graduate engineering courses		

PROJECT OPTION

ME 7945	Master's Project	4
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Electives		
Complete 12 semester hours in the following subject areas:		12
ME, MATL, or other graduate engineering courses		

THESIS OPTION

ME 7990	Thesis [1]	8
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Electives		
Complete 8 semester hours in the following subject areas:		8
ME, MATL, or other graduate engineering courses		

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

[1] Required for all students who receive financial support from the university in the form of a research, teaching, or tuition assistantship.

Mechanical Engineering with Concentration in Mechatronics, MSME

While pursuing a Master of Science in Mechanical Engineering, students may choose mechatronics as a concentration. The term mechatronics stems from the combination of words mechanical and electronics. Mechatronics is a multidisciplinary approach to product design and development, merging the principles of electrical, mechanical, computer, material, chemical, and industrial engineering. Mechatronic systems are typically composed of traditional mechanical and electrical components but are referred to as "intelligent" devices due to the incorporation of sensors, actuators, and computer control systems. Mechatronics can be viewed as a "modern engineering process" that deals with the design and manufacturing of intelligent products or systems involving hybrid mechanical and electronic functions. Our primary focus in mechatronic systems is on intelligent and integrated systems and machines along with their practical applications ranging from manufacturing systems and robotic platforms to biological systems. Our research and teaching together are designed to prepare students to understand and exploit mechatronics to enable their future engineering innovations.

General Degree Requirements

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science in engineering, science, mathematics, or an equivalent field. Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Students can complete a master's degree by pursuing any of one of the three tracks: course work option, project option, and thesis option. Specific degree requirements for each of these tracks can be found under the "Program Requirements" tab. Students may pursue any master's program either on a full-time or part-time basis; however, certain restrictions may apply.

Special Course Requirements

All mechanical and industrial engineering (MIE) MS students doing thesis or project options (excluding MS students in engineering management and Gordon Engineering Leadership programs) must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during the first year of their full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements. Students in combined BS/MS programs pursuing thesis or project options, must take Research Seminar in Mechanical and Industrial Engineering (MEIE 6850) as part of their course work requirement, while Technical Writing (MEIE 6800) is optional for these students.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. Outcome of the online session will be filed with the student's records.

Academic and Research Advisors

All nonthesis students are advised by the academic advisor designated for their respective concentration or program. Students doing thesis option must find a research advisor within their first year of study and may have thesis reader(s) at the discretion of their research advisor. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor.Thesis-option students are advised by the academic advisor designated for their specific concentration before they select their research advisor(s).

Plan of Study and Course Selection

It is recommended that all new students attend orientation sessions held by the MIE department and the Graduate School of Engineering to acquaint themselves with the course work requirements and research activities of the department as well as with the general policies, procedures, and expectations.

In order to receive proper guidance with their course work needs, all MS students are strongly encouraged to complete and submit a fully signed Plan of Study (PS) to the department before enrolling in second-semester courses. This form helps the students manage their course work as well as helps the department to plan for requested course offerings. The PS may be modified at any time as students progress in their degree programs. However, requests for changes in the PS must be processed before the requested change actually takes place. A revised PS form must also be approved and signed.

Each student's academic advisor must approve all courses prior to registration. Students may only use courses taken with the approval of the academic advisor toward the 32-semester-hour minimum requirement. However, students may petition the MIE Graduate Affairs Committee to substitute graduate-level courses from outside the approved list of electives.

Students pursuing study or research under the guidance of a faculty member can choose the project option by taking Master's Project (ME 7945). An MS project must be petitioned to the MIE Graduate Affairs Committee and approved by both faculty member (instructor) and the academic (concentration) advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme.

Students doing the course work option may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour Independent Study (ME 7978). An independent study must be approved by the academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme. Students in other options (i.e. thesis or project) are not eligible to take independent study.

Options for MS Students (course work only, project, or thesis)

Students accepted into any of the MS programs in the MIE department can choose one of the three options; course work only, project, or thesis. Please see the "Program Requirements" tab on the top menu of this page for more information. MS students who want to pursue project or thesis options must find, within their first year of study, a faculty member or a research advisor who will be willing to direct and supervise a mutually agreed research project or MS thesis. Moreover, students who receive financial support from the university in the form of a research, teaching, or tuition assistantship must complete an 8-semester-hour thesis.

Students who complete thesis option must make a presentation of their thesis before approval by the department. The MS thesis presentation shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate. If deemed appropriate by the research advisor, other faculty members may be invited to serve as thesis readers to provide technical opinions and judge the quality of the thesis and presentation.

Change of Program/Concentration

Students enrolled in any of the MIE department programs or concentrations may change their current program or concentration no sooner than the end of their first full-time semester of study. In order for the program or concentration change request to be considered by the MIE Graduate Affairs Committee, the student must be in good academic standing and have completed at least 8 semester hours of course work at Northeastern. See here (p. 112) for instructions on how to request a program or concentration change.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Mechanical Engineering with a Concentration in Mechatronics with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Mechanical Engineering with a Concentration in Mechatronics in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 36-semester-hour degree and certificate will require 20 hours of advisor-approved mechatronics technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Mathematics Competency		
Complete 4 semester hours from the following:		4
ME 6200	Mathematical Methods for Mechanical Engineers 1	
ME 6201	Mathematical Methods for Mechanical Engineers 2	
Mechanics Competency		
Complete 4 semester hours from the following:		4
ME 5650	Advanced Mechanics of Materials	
ME 5655	Dynamics and Mechanical Vibration	
ME 5657	Finite Element Method	
Mechatronics Concentration		
ME 5245	Mechatronic Systems	4
ME 5659	Control Systems Engineering	4
Electrical Competency		
Complete 4 semester hours from the following:		4
EECE 5610	Digital Control Systems	
EECE 5666	Digital Signal Processing	

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 12 semester hours from the course list.		12

PROJECT OPTION

ME 7945	Master's Project	4
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Complete 8 semester hours from the course list.		8

THESIS OPTION

ME 7990	Thesis [1]	8
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Complete 4 semester hours from the course list.		4

Course List

CHME 7231	Chemical Process Dynamics and Control
CS 5320	Digital Image Processing
EECE 5606	Micro- and Nanofabrication
EECE 5576	Wireless Communication Systems
EECE 5686	Electrical Machines
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication
EECE 7359	Multiprocessor Architectures
EECE 7367	Robotics and Automation Systems
IE 5630	Biosensor and Human Behavior Measurement
ME 5250	Robot Mechanics and Control
ME 6260	Introduction to Microelectromechanical Systems (MEMS)
ME 7247	Advanced Control Engineering
ME 7253	Advanced Vibrations
ME 7315	Heat Transfer Processes in Microelectronic Devices

Or any other ME or MATL course or other graduate engineering course

Program Credit/GPA Requirements

32 total semester hours required
36 total semester hours required for students completing the Gordon Engineering Leadership Program in combination with the MSME degree
Minimum 3.000 GPA required

[1] Required for all students who receive financial support from the university in the form of a research, teaching, or tuition assistantship.

Mechanical Engineering with Concentration in Thermofluids, MSME

While pursuing a Master of Science in Mechanical Engineering, students may choose thermofluids as a concentration. Some of the representative research areas under this concentration may include thermodynamics, fluid dynamics, kinetic theory of gases, thermophoresis of aerosols; microscale heat transfer phenomena and its effects on laser beam propagation; fundamentals of combustion such as burning speed and onset of auto-ignition measurement and flame stability analysis; development of chemistry reduction such as rate-controlled constrained-equilibrium method; nonequilibrium thermodynamics; energy and gas turbine cooling technology, turbine blade cooling; and energy-related and calorimeter studies related to pharmaceutical developments. Our research and teaching together seek to prepare students to understand and exploit thermofluids to enable their future engineering innovations.

General Degree Requirements

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science in engineering, science, mathematics, or an equivalent field. Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Students can complete a master's degree by pursuing any of one of the three tracks: course work option, project option, and thesis option. Specific degree requirements for each of these tracks can be found under the "Program Requirements" tab. Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

Special Course Requirements

All mechanical and industrial engineering (MIE) MS students in thesis or project options (excluding MS students in engineering management and Gordon Engineering Leadership programs) must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during the first year of their full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements. Students in combined BS/MS programs pursuing thesis or project options must take Research Seminar in Mechanical and Industrial Engineering (MEIE 6850) as part of their course work requirement, while Technical Writing (MEIE 6800) is optional for these students.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one

of these courses. Outcome of the online session will be filed with the student's records.

Academic and Research Advisors

All nonthesis students are advised by the academic advisor designated for their respective concentration or program. Students doing thesis option must find a research advisor within their first year of study and may have thesis reader(s) at the discretion of their research advisor. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Thesis-option students are advised by the academic advisor designated for their concentration before they select their research advisor(s).

Plan of Study and Course Selection

It is recommended that all new students attend orientation sessions held by the MIE department and the Graduate School of Engineering to acquaint themselves with the course work requirements and research activities of the department as well as with the general policies, procedures, and expectations.

In order to receive proper guidance with their course work needs, all MS students are strongly encouraged to complete and submit a fully signed Plan of Study (PS) to the department before enrolling in second-semester courses. This form helps the students manage their course work as well as helps the department to plan for requested course offerings. The PS may be modified at any time as students progress in their degree programs. However, requests for changes in PS must be processed before the requested change actually takes place. A revised PS form must also be approved and signed.

Each student's academic advisor must approve all courses prior to registration. Students may only use courses taken with the approval of the academic advisor toward the 32-semester-hour minimum requirement. However, students may petition the MIE Graduate Affairs Committee to substitute graduate-level courses from outside the approved list of electives.

Students pursuing study or research under the guidance of a faculty member can choose project option by taking Master's Project (ME 7945). An MS project must be petitioned to the MIE Graduate Affairs Committee and approved by both the faculty member (instructor for Master's Project) and the student's academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme.

Students doing course work option may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour Independent Study (ME 7978). An independent study must be approved by the academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as the expected outcomes, deliverables, and grading scheme. Students in other options (i.e. thesis or project) are not eligible to take independent study.

Options for MS Students (course work only, project, or thesis)

Students accepted into any of the MS programs in the MIE department can choose one of the three options; course work only, project, or thesis. Please see the "Program Requirements" tab on the top menu of this page for more information. MS students who want to pursue project or thesis options must find, within the first year of their study, a faculty member or a research advisor who will be willing to direct and supervise a mutually agreed research project or MS thesis. Moreover, students who receive financial support from the university in the form of a research, teaching, or tuition assistantship must complete an 8-semester-hour thesis.

Students who complete the thesis option must make a presentation of their thesis before approval by the department. The MS thesis presentation shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate. If deemed appropriate by the research advisor, other faculty members may be invited to serve as thesis readers to provide technical opinions and judge the quality of the thesis and presentation.

Change of Program/Concentration

Students enrolled in any of the MIE department programs or concentrations may change their current program or concentration no sooner than the end of their first full-time semester of study. In order for the program or concentration change request to be considered by the MIE Graduate Affairs Committee, the student must be in good academic standing and have completed at least 8 semester hours of course work at Northeastern. See here (p. 112) for instructions on how to request a program or concentration change.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Mechanical Engineering with a Concentration in Thermofluids with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Mechanical Engineering with a Concentration in Thermofluids in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 36-semester-hour degree and certificate will require 20 hours of advisor-approved thermofluids technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

ME 6200	Mathematical Methods for Mechanical Engineers 1	4
or ME 6201	Mathematical Methods for Mechanical Engineers 2	
ME 7270	General Thermodynamics	4
ME 7275	Essentials of Fluid Dynamics	4
ME 7285	Heat Conduction and Thermal Radiation	4
or ME 7290	Convective Heat Transfer	
Thermofluids Concentration Course		
Complete 4 semester hours from the following:		4
ME 5685	Solar Thermal Engineering	
ME 5690	Gas Turbine Combustion	

ME 5695	Aerodynamics
ME 7280	Statistical Thermodynamics
ME 7295	Multiscale Flow and Transport Phenomena
ME 7300	Combustion and Air Pollution
ME 7305	Fundamentals of Combustion
ME 7310	Computational Fluid Dynamics with Heat Transfer
ME 7330	Turbulent Flow
ME 7340	Turbomachinery Design

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 8 semester hours from the following:		8
ME 5685	Solar Thermal Engineering	
ME 5690	Gas Turbine Combustion	
ME 5695	Aerodynamics	
ME 7280	Statistical Thermodynamics	
ME 7295	Multiscale Flow and Transport Phenomena	
ME 7300	Combustion and Air Pollution	
ME 7305	Fundamentals of Combustion	
ME 7310	Computational Fluid Dynamics with Heat Transfer	
ME 7330	Turbulent Flow	
ME 7340	Turbomachinery Design	
Complete 4 semester hours from the following:		4
ME, MATL, or other graduate engineering course		

PROJECT OPTION

ME 7945	Master's Project	4
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Complete 4 semester hours from the following:		4
ME 5685	Solar Thermal Engineering	
ME 5690	Gas Turbine Combustion	
ME 5695	Aerodynamics	
ME 7280	Statistical Thermodynamics	
ME 7295	Multiscale Flow and Transport Phenomena	
ME 7300	Combustion and Air Pollution	
ME 7305	Fundamentals of Combustion	
ME 7310	Computational Fluid Dynamics with Heat Transfer	
ME 7330	Turbulent Flow	
ME 7340	Turbomachinery Design	
Complete 4 semester hours from the following:		4
ME, MATL, or other graduate engineering course		

THESIS OPTION

ME 7990	Thesis [1]	8
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Complete 4 semester hours from the following:		4
ME, MATL, or other graduate engineering course		

Program Credit/GPA Requirements

32 total semester hours required
36 total semester hours required for students completing the Gordon Engineering Leadership Program in combination with the MSME degree
Minimum 3.000 GPA required

[1] Required for all students who receive financial support from the university in the form of a research, teaching, or tuition assistantship.

Operations Research, MSOR

The Department of Mechanical and Industrial Engineering (MIE) offers comprehensive research and educational programs for students pursuing the Master of Science (MS) in Operations Research (OR). These extensive programs and course work allow for the selection of a degree that meets a wide range of personal and professional goals.

General Degree Requirements

To be eligible for admission to any of the MS degree programs, a prospective student must hold a Bachelor of Science degree in engineering, science, mathematics, or an equivalent field. Students in all master's degree programs must complete a minimum of 32 semester hours of approved course work (exclusive of any preparatory courses) with a minimum grade-point average (GPA) of 3.000. Students can complete a master's degree by pursuing any one of the three tracks: course work option, project option, and thesis option. Specific degree requirements for each of these tracks can be found under the "Program Requirements" tab. Also, students can complete their master's degree either on a full-time or part-time basis; however, certain restrictions may apply.

Special Course Requirements

All MIE MS students pursuing thesis or project options (excluding MS students in engineering management and Gordon Engineering Leadership programs) must complete Technical Writing (MEIE 6800) and Research Seminar in Mechanical and Industrial Engineering (MEIE 6850), preferably during the first year of full-time study. If appropriate, part-time students may petition the Graduate Affairs Committee to waive these requirements. Students in combined BS/MS programs pursuing thesis or project options must take Research Seminar in Mechanical and Industrial Engineering (MEIE 6850) as part of their course work requirement, while Technical Writing (MEIE 6800) is optional for these students.

All MIE graduate students are also required to complete a brief online session on Responsible Conduct of Research and Plagiarism in one of these courses. The outcome of the online session will be filed with the student's records.

Academic and Research Advisors

All nonthesis students (students doing course work or project options) are advised by the academic advisor designated for their respective concentration or program. Students doing an MS thesis must find a research advisor within the first year of their study and may have thesis reader(s) at the discretion of their research advisor. The research advisor must be a full-time or jointly appointed faculty or affiliated member of the MIE department; otherwise, a petition must be filed and approved by the MIE Graduate Affairs Committee. If the research advisor is outside the MIE department, a faculty member with 50 percent or more appointments in the MIE department must be chosen as the co-advisor. Thesis option

students are advised by the academic advisor designated for their specific concentration before they select their research advisor(s).

Plan of Study and Course Selection

It is recommended that all new students attend orientation sessions held by the MIE department and the Graduate School of Engineering to acquaint themselves with the course work requirements and research activities of the department as well as with the general policies, procedures, and expectations.

In order to receive proper guidance with their course work needs, all MS students are strongly encouraged to complete and submit a fully signed Plan of Study (PS) to the department before enrolling in second-semester courses. This form helps students manage their course work as well as helps the department to plan for requested course offerings. The PS may be modified at any time as the students progress in their degree programs. However, requests for changes in the PS must be processed before the requested change actually takes place. A revised PS form must also be approved and signed by the student's academic advisor.

Students pursuing study or research under the guidance of a faculty member can elect for project option by taking Master's Project (OR 7945). An MS project must be petitioned to the MIE Graduate Affairs Committee and approved by both the faculty member (instructor for MS Project) and the student's academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as expected outcomes, deliverables, and grading scheme.

Students doing course work option may petition the MIE Graduate Affairs Committee to substitute up to a 4-semester-hour Independent Study (OR 7978). An independent study must be approved by the academic advisor. The petition must clearly state the reason for taking the course; a brief description of the goals; as well as expected outcomes, deliverables, and grading scheme. Students in other options (i.e., thesis or project) are not eligible to take independent study.

Options for MS Students (course work only, project, or thesis)

Students accepted into any of the MS programs in the MIE department can choose one of the three options: course work only, project, or thesis. Please see the "Program Requirements" tab on the top menu of this page for more information. MS students who want to pursue project or thesis options must find, within their first year of study, a faculty member or a research advisor who will be willing to direct and supervise a mutually agreed research project or MS thesis. Moreover, students who receive financial support from the university in the form of a research, teaching, or tuition assistantship must complete an 8-semester-hour thesis.

Students who complete the thesis option must make a presentation of their thesis before approval by the department. The MS thesis presentation shall be publicly advertised at least one week in advance and all faculty members and students may attend and participate. If deemed appropriate by the research advisor, other faculty members may be invited to serve as thesis readers to provide technical opinions and judge the quality of the thesis and presentation.

Change of Program/Concentration

Students enrolled in any of the MIE department programs or concentrations may change their current program or concentration no sooner than the end of their first full-time semester of study. In order for the program or concentration change request to be considered by the MIE Graduate Affairs Committee, the student must be in good academic standing and have completed at least 8 semester hours of course work at Northeastern. See here (p. 112) for instructions on how to request a program or concentration change.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Operations Research with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Operations Research in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved operations research technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

IE 6200	Engineering Probability and Statistics	4
or MATH 7241	Probability 1	
OR 7245	Network Analysis and Advanced Optimization	4
or MATH 7234	Optimization and Complexity	
OR 7230	Probabilistic Operation Research	4
or MATH 7341	Probability 2	
OR 6205	Deterministic Operations Research	4

Options

Select one of the following options:

COURSE WORK OPTION

Complete 16 semester hours from the course list below.		16

PROJECT OPTION

OR 7945	Master's Project	4
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Complete 12 semester hours from the course list below.		12

THESIS OPTION

OR 7990	Thesis (required for all students who receive financial support from the university in the form of a research, teaching, or tuition assistantship)	8
MEIE 6800	Technical Writing	0
MEIE 6850	Research Seminar in Mechanical and Industrial Engineering	0
Complete 8 semester hours from the course list below.		8

Course List

CS 5800	Algorithms
CS 6140	Machine Learning
CS 7805	Theory of Computation
CSYE 6200	Concepts of Object-Oriented Design
CSYE 6205	Concepts of Object-Oriented Design with C++
CSYE 6210	Component Software Development
GE 5010	Customer-Driven Technical Innovation for Engineers
GE 5100	Product Development for Engineers
EECE 7313	Pattern Recognition
EECE 7360	Combinatorial Optimization
EMGT 5220	Engineering Project Management
EMGT 5300	Engineering/Organizational Psychology
EMGT 6225	Economic Decision Making
EMGT 6305	Financial Management for Engineers
IE 5400	Healthcare Systems Modeling and Analysis
IE 5500	Systems Engineering in Public Programs
IE 5617	Lean Concepts and Applications
IE 5620	Mass Customization
IE 5630	Biosensor and Human Behavior Measurement
IE 6300	Manufacturing Methods and Processes
IE 7200	Supply Chain Engineering
IE 7215	Simulation Analysis
IE 7275	Data Mining in Engineering
IE 7280	Statistical Methods in Engineering
IE 7285	Statistical Quality Control
IE 7290	Reliability Analysis and Risk Assessment
IE 7315	Human Factors Engineering
IE 7615	Neural Networks in Engineering
INFO 6205	Program Structure and Algorithms
INFO 6210	Data Management and Database Design
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory
MATH 7342	Mathematical Statistics
MATH 7346	Time Series
MATH 7347	Statistical Decision Theory
MATH 7349	Stochastic Calculus and Introduction to No-Arbitrage Finance
OR 7235	Inventory Theory
OR 7240	Integer and Nonlinear Optimization
OR 7250	Multi-Criteria Decision Making
OR 7260	Constraint Programming
OR 7310	Logistics, Warehousing, and Scheduling

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Data Analytics Engineering, Graduate Certificate

The Data Analytics Engineering Graduate Certificate program focuses on fundamental concepts, tools and techniques to extract information from large data sets in order to support effective decision making. This program is designed to provide opportunities for students to master high-demand data intelligence skills through hands-on experience on data storage, data retrieval, data visualization and prediction.

This four-course graduate certificate enables the students to apply the fundamentals of engineering knowledge and skills to database design, data pre- and post-processing for further analysis, data visualization for impactful infographics, statistical concepts for quantitative analysis and data mining techniques and algorithms for knowledge discovery.

Note: MS in Data Analytics students are not eligible for this graduate certificate.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
EECE 5642	Data Visualization	4
IE 7275	Data Mining in Engineering	4
IE 7280	Statistical Methods in Engineering	4
INFO 6210	Data Management and Database Design	4

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Data Mining Engineering, Graduate Certificate

The Graduate Certificate in Data Mining Engineering focuses on the creation of statistical and predictive models and algorithms to analyze large data sets with attention on extracting information from data sets and transforming data into structures for further analysis.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of engineering knowledge and skills to data warehousing, data management, data pre- and postprocessing, development of statistical models, structures discovery, and data visualization.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Complete three of the following:		12
IE 5640	Data Mining for Engineering Applications	
or IE 7275	Data Mining in Engineering	
INFO 5100	Application Engineering and Development	
or CSYE 6200	Concepts of Object-Oriented Design	
INFO 6210	Data Management and Database Design	

INFO 7390	Advances in Data Sciences and Architecture	
Complete one of the following:		4
EECE 5626	Image Processing and Pattern Recognition	
EECE 7313	Pattern Recognition	
IE 7280	Statistical Methods in Engineering	
INFO 7290	Data Warehousing and Business Intelligence	

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Multidisciplinary Programs

Website (http://www.coe.neu.edu/graduate-school/multidisciplinary)

Tristan E. Johnson, Ph.D.
Assistant Dean of Multidisciplinary Graduate Education and Digital Learning
Suite 500 Dana Research Center
617.373.6775
617-373-2501 (fax)

The multidisciplinary graduate engineering Master of Science (MS) programs integrate engineering with the fields of technology and business by developing technical and engineering skills through advanced course work and complex technical projects. Each program focuses on the application of knowledge and skills to business and industrial settings. The multidisciplinary graduate programs blend academic and corporate experience to enable students to enhance their professional capabilities, thereby facilitating career transformation. Given an applied focus, each program provides learning opportunities to develop the skills needed to create innovative, practical, and effective solutions that can be easily applied to current professional challenges.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering Leadership Program (p. 204) in combination with the MS degree.

Programs

Master of Science in Computer Systems Engineering (MSCSE)

- Computer Systems Engineering with Concentration in Software Design Engineering (p. 195)

Master of Science in Engineering Management (MSEM)

- Engineering Management (p. 196)

Master of Science in Energy Systems (MSENES)

- Energy Systems (p. 199)
- Energy Systems—ALIGN Program (p. 200)

Master of Science in Information Systems (MSIS)

- Information Systems (p. 201)

Master of Science in Telecommunications Systems Management (MSTSM)

- Telecommunications Systems Management (p. 202)

Graduate Certificates

- Broadband Wireless Systems (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/broadband-wireless-systems-graduate-certificate)
- Business intelligence and Data Analytics (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/business-intelligence-data-analytics-graduate-certificate)
- Computer Systems Engineering (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/computer-systems-graduate-certificate)
- Energy Systems (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/energy-systems-graduate-certificate)
- Energy Systems Management (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/energy-systems-management-graduate-certificate)
- Engineering Business (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-business-graduate-certificate)
- Engineering Economic Decision Making (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-economic-decision-making-graduate-certificate)
- Engineering Management (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-management-graduate-certificate)
- IP Telephony Systems (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/ip-telephony-systems-graduate-certificate)
- Lean Six Sigma (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/lean-six-sigma-graduate-certificate)
- Renewable Energy (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/renewable-energy-graduate-certificate)
- Supply Chain Engineering Management (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/supply-chain-engineering-management-graduate-certificate)
- Sustainable Energy Systems (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/sustainable-energy-systems-graduate-certificate)
- Technology Systems Management (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/technology-systems-management-graduate-certificate)

Computer Systems Engineering with Concentration in Software Design Engineering, MSCSE

Website (http://www.coe.neu.edu/degrees/ms-cse)

Kal Bugrara, PhD
Senior Program Director

Dana Hall 5th Floor
617.373.4448
kmb@coe.neu.edu

Our computer systems engineering program takes a sociotechnical, engineering approach to software. This engineering foundation is designed to enable students to embrace real-world complexity as a golden opportunity, especially for the more technically advanced student. We are committed to shaping our students to be intuitive problem solvers, experienced engineering architects, and result leaders who will have a great impact at the exciting three-way intersection of computer science, engineering, and ethics.

Our program offers a multitude of courses in big-data engineering and analytics in addition to supplementary courses that are required to deliver the data-analytics results in a meaningful way to management. We cover data management, advanced data management, business intelligence, column databases, data science, and big-data engineering. We offer advanced functional programming using the powerful Scala language and a course on advanced data science as well as cloud computing. Multi-thread concurrent computing is also offered as it is important for synchronizing a huge set of servers working in parallel to do large-scale analytics to make things run faster by a hundredfold increase in speed. Due to the high-level mathematical operations required to run these programs, only software engineers have the capacity to work in such complicated areas. Only they can make the necessary mathematical algorithms execute quickly enough to get the finest results.

Our engineers become fluent in data science for the sake of building the actual system. They study how to write machine-learning algorithms on top of statistical packages.

- Students study the fundamentals of logical computing formulation and program construction as well as the mathematical modeling and analysis of algorithms—an essential aspect of data science analytics.
- Students study clustering techniques, along with topic modeling and classification and logical regression techniques, as well as Bayesian statistics.
- Students study how to configure and operate a Hadoop environment (large clusters of commodity hardware) and in the process how to integrate data from diverse sources, to move and manage data through big-data platforms (in-house or in the cloud). Data ingestion, the filtering and firing of millions of operations to run over large clusters of commodity hardware, is a software-engineering technique that we teach our students how to perform through Scala, multi-threading, Spark programming, and “map-reduce” techniques.
- We show students how to make the business case for analytics projects and how to follow an execution road map that involves understanding the architectures underpinning such gigantic platforms as well as the resourcing and cost issues.

Degree Requirements

A minimum of 32 semester hours must be earned toward completion of the Master of Science in Computer Systems Engineering degree. A minimum grade-point average (GPA) of 3.000 is required in all courses applied toward the degree.

The program does not accept any transfer credit. All 32 credits must be completed from the IS and CSYE program course work specified.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Computer Systems Engineering with a Concentration in Software Design Engineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Computer Systems Engineering with a Concentration in Software Design Engineering in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved software design engineering technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

CSYE 6200	Concepts of Object-Oriented Design	4
CSYE 6220	Enterprise Software Design	4

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 24 semester hours in the following subject areas:	24
INFO (INFO 6250 excluded), CSYE	

THESIS OPTION [1]

CSYE 7990	Thesis	8
Complete 16 semester hours in the following subject areas:		16
INFO (except INFO 6250), CSYE		

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

[1] Students who elect to pursue the thesis option must first propose a topic and advisor for their thesis and receive approval from the program director.

Engineering Management, MSEM

Website (http://www.mie.neu.edu/degrees/ms-em/#_ga=1.249037760690259088144372 5887)

Thomas P. Cullinane, PhD
Professor and Program Director
334 Snell Engineering
617.373.4851
t.cullinane@northeastern.edu

Himlona Palikhe, PhD
Assistant Teaching Professor and Advisor
504A Dana Research Center
617.373.4288
h.palikhe@northeastern.edu

The Master of Science in Engineering Management offers graduate students an opportunity to develop both technical expertise and business competence that is in high demand among prospective technology-based employers. Industry leaders are seeking qualified and talented individuals who are not only able to guide research and design teams but also able to direct and supervise development and production processes. The combination of technical proficiency and business skills fostered in the engineering management program is designed to provide a competitive edge for graduates seeking a wide range of positions in technology-based product or service industries, as well as in comparable local, state, and federal agencies and programs.

The program was designed by experienced high-level managers and academic leaders as an option for engineers and scientists to broaden their skill sets to include management tools and techniques that are applicable to technology-based industries. Graduates of the engineering management program work as project managers or leaders of teams in technology-based industries. Upon completion of the program, students find that their acquired skills are applicable to a wide range of industries, primarily those focused upon the development of technical products and the management of technical projects.

Graduates may assist companies in bringing a product from an idea through its development phases to its introduction to the marketplace. They may also be involved in forming and managing teams for assessing cost-effectiveness, formulating strategies to improve production, or analyzing a company's supply chain. Most of these projects cannot be successfully completed without the skills of those possessing a background in management decision making and engineering expertise; therefore, the engineering management graduate is often a technical liaison to management. As a result, many of the assignments held by engineering management graduates have actually proven to be a gateway to upper-level management positions.

The current program of study can be taken on a part-time or full-time basis on-ground or online. There are four core courses required of all students, which have been formulated to satisfy the foundation requirements of economic decision making, decision-making mathematics, and project management. In addition to these required courses, the curriculum consists of electives that allow students to choose either a broad-based program of study or one centered on a particular concentration. Some students may elect to refresh or enhance their technical skills in engineering-based subjects such as information systems, computer systems engineering, or graduate courses from the traditional engineering disciplines. Other students may prefer to broaden their knowledge base by selecting course work in management subjects such as engineering organizational psychology, financial management, logistics and warehousing, supply chain engineering, or lean systems design. Additionally, students may also elect to complete the Gordon Engineering Leadership Program as part of their engineering management degree.

One recent graduate has observed that "Northeastern's MSEM is like an MBA for engineers, with high-quality, dedicated professors who are proficient in their field yet are able to convey information in a way that's easy to understand." This graduate also noted, "My courses in project management have been key to understanding the subtleties that affect Project Managers while technical courses provide a strong background in fundamentals as well as specialty topics. My experience with co-op has been outstanding and has truly helped me further my career."

A minimum of 32 semester hours must be earned toward the completion of the Master of Science in Engineering Management and a minimum grade-point average (GPA) of 3.000 is required over all the courses applied toward the degree. Students can earn their master's degree by pursuing one of the following tracks:

- **Course work option:** When pursuing this track, a student needs to complete four core courses (also known as required courses) and four elective courses.
- **Project option:** This track requires a student to complete a 4-semester-hour master's project in addition to completing four core courses and three electives. The student works with a faculty advisor to develop a master's project. The project is intended to allow a student to demonstrate the ability to identify a problem, apply his or her engineering skill set to solve that problem, and write an engineering report.
- **Thesis option:** A student pursuing this track needs to complete an 8-semester-hour thesis, four core courses, and two electives. In addition, the student will work with a faculty advisor to formulate a research area that will lead to the discovery of new tools and techniques for solving engineering problems. The criterion for acceptability of a thesis is whether a cutting-edge and innovative technology is developed.
- **Online option:** Students pursuing this track complete their four core courses online and then choose 16 semester hours of online elective courses.

Degree Requirements

Degree Requirements	Course Work Only	With Project	With Thesis
Required and elective courses	32 SH	28 SH	24 SH
Project/thesis	0 SH	4 SH	8 SH
Minimum semester hours required	32 SH	32 SH	32 SH

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Engineering Management with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Engineering Management in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16 semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate will require 16 hours of advisor-approved engineering management technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

OR 6205	Deterministic Operations Research	4
EMGT 5220	Engineering Project Management	4

EMGT 6225	Economic Decision Making	4
IE 6200	Engineering Probability and Statistics	4

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 16 semester hours from the course list below. (p. 198)		16
Note: Other approved courses may be selected in consultation with an academic advisor.		

PROJECT OPTION

EMGT 7945	Master's Project	4
Complete 12 semester hours from the course list below. (p. 198)		12
Note: Other approved courses may be selected in consultation with an academic advisor.		

THESIS OPTION

EMGT 7990	Thesis	8
Complete 8 semester hours from the course list below. (p. 198)		8
Note: Other approved courses may be selected in consultation with an academic advisor.		

ONLINE OPTION

Complete 16 semester hours from the following list of online elective courses:		16
CIVE 5270	Environmental Protection and Management	
EMGT 5300	Engineering/Organizational Psychology	
EMGT 6305	Financial Management for Engineers	
ENSY 5000	Fundamentals of Energy System Integration	
IE 5620	Mass Customization	
IE 5640	Data Mining for Engineering Applications	
IE 6300	Manufacturing Methods and Processes	
IE 7200	Supply Chain Engineering	
IE 7215	Simulation Analysis	
IE 7280	Statistical Methods in Engineering	
IE 7285	Statistical Quality Control	
IE 7290	Reliability Analysis and Risk Assessment	
IE 7315	Human Factors Engineering	
INFO 6210	Data Management and Database Design	
INFO 6215	Business Analysis and Information Engineering	
ME 5645	Environmental Issues in Manufacturing and Product Use	
ME 6200	Mathematical Methods for Mechanical Engineers 1	
OR 7230	Probabilistic Operation Research	
OR 7240	Integer and Nonlinear Optimization	
OR 7310	Logistics, Warehousing, and Scheduling	

Course List

CSYE 6200	Concepts of Object-Oriented Design
CSYE 6205	Concepts of Object-Oriented Design with C++
CSYE 6210	Component Software Development
CSYE 6220	Enterprise Software Design
CSYE 7230	Software Engineering
CSYE 7270	Building Virtual Environments
CSYE 7280	User Experience Design and Testing
ENSY 5000	Fundamentals of Energy System Integration
EMGT 5300	Engineering/Organizational Psychology
EMGT 6305	Financial Management for Engineers
EMGT 7978	Independent Study
GE 5010	Customer-Driven Technical Innovation for Engineers
GE 5100	Product Development for Engineers
IE 5400	Healthcare Systems Modeling and Analysis
IE 5500	Systems Engineering in Public Programs
IE 5617	Lean Concepts and Applications
IE 5620	Mass Customization
IE 5640	Data Mining for Engineering Applications
IE 6300	Manufacturing Methods and Processes
IE 7200	Supply Chain Engineering
IE 7215	Simulation Analysis
IE 7270	Intelligent Manufacturing
IE 7275	Data Mining in Engineering
IE 7280	Statistical Methods in Engineering
IE 7285	Statistical Quality Control
IE 7290	Reliability Analysis and Risk Assessment
IE 7315	Human Factors Engineering
IE 7615	Neural Networks in Engineering
INFO 6210	Data Management and Database Design
INFO 6215	Business Analysis and Information Engineering
INFO 6245	Planning and Managing Information Systems Development
INFO 7245	Agile Software Development
INFO 7260	Business Process Engineering
INFO 7275	Advanced Database Management Systems
INFO 7285	Organizational Change and IT
INFO 7290	Data Warehousing and Business Intelligence
INFO 7330	Information Systems for Healthcare-Services Delivery
INFO 7365	Enterprise Architecture Planning and Management
INFO 7390	Advances in Data Sciences and Architecture
OR 7230	Probabilistic Operation Research

OR 7235	Inventory Theory
OR 7240	Integer and Nonlinear Optimization
OR 7245	Network Analysis and Advanced Optimization
OR 7250	Multi-Criteria Decision Making
OR 7310	Logistics, Warehousing, and Scheduling
TELE 5310	Fundamentals of Communication Systems
TELE 5330	Data Networking
Electives outside the College of Engineering	
ENTR 6200	Enterprise Growth and Innovation
ENTR 6212	Business Planning for New Ventures
ENTR 6218	Business Model Design and Innovation
ENTR 6219	Financing Ventures from Early Stage to Exit
MGSC 6206	Management of Service and Manufacturing Operations
SCHM 6212	Executive Roundtable in Supply Chain Management
SCHM 6214	Sourcing and Procurement
SCHM 6215	Supply Chain Analytics
SCHM 6221	Sustainability and Supply Chain Management
SCHM 6222	Managing Emerging Issues in Supply Chain Management
SCHM 6223	Managing Healthcare Supply Chain Operations
SCHM 6224	Demand Planning and Forecasting
TECE 6200	Innovation and Entrepreneurial Growth
TECE 6222	Emerging and Disruptive Technologies
TECE 6230	Entrepreneurial Marketing and Selling
TECE 6250	Lean Design and Development
TECE 6300	Managing a Technology-Based Business
TECE 6340	The Technical Entrepreneur as Leader

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Energy Systems, MSENES

Website (http://www.coe.neu.edu/degrees/ms-es)

Hameed Metghalchi, Sc.D.
Professor and Program Director
Editor-in-Chief, Journal of Energy Resources Technology
334 Snell Engineering
617.373.2973
m.metghalchi@northeastern.edu

The Master of Science in Energy Systems (MSENES) integrates engineering, business, and policy into a high-level signature, multidisciplinary graduate program. Energy systems students have an opportunity to learn how to leverage business skills and public policy knowledge to accomplish their engineering goals. This program is ideal for the engineer or technical business major who is interested in pursuing an industrial or public-planning-based career.

The program's mission is to educate students in current and future energy systems technologies, to integrate energy-related technologies with the economics and financial considerations required to implement them, and to develop leadership and decision-making skills to implement energy systems in either the private or public sectors of the global market. The program will expose students to a combination of academic and corporate experience in energy systems.

The program curriculum features a multidisciplinary range of electives from five different academic colleges at Northeastern. The curriculum is flexibly designed with a set of four core courses in engineering knowledge and finance in addition to four electives. The core courses help relate these electives back to energy-related engineering concepts, including heat and power strategies, energy renewal, sustainable energy solutions, and energy storage. By integrating concepts across these disciplines, our students learn that implementing energy solutions requires an economic solution as well as an engineering one.

Students are exposed to business educators and practicing professionals and have the opportunity to participate in a six-month co-op experience. Practicing professionals with experience in the industry who have successfully implemented energy systems or devices and policies are actively involved in the program as adjunct professors and invited speakers. Through this curriculum and interaction with practitioners, students should be prepared to effectively integrate energy system development over a broad spectrum of technologies with the financial requirements to successfully implement them and to compete in the global energy market.

Successful graduates of the program will be involved in the decision making or policy planning that will deliver minimally polluting, energy-efficient systems to the global market. They will have the base training necessary to lead efforts within companies to plan and implement new energy-generation investments, realize energy-efficiency improvements specifically at the system level, and participate in energy and environmental markets such as cap-and-trade systems.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Energy Systems with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Energy Systems in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 36-semester-hour degree and certificate will require 20 hours of advisor-approved energy systems technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

EMGT 6225	Economic Decision Making	4

ENSY 5000	Fundamentals of Energy System Integration	4
ME 6200	Mathematical Methods for Mechanical Engineers 1	4
FINA 6309	Foundations of Accounting and Finance	3,4

Options

Complete one of the following options:

GENERAL OPTION

Complete 16 semester hours from the following: 16

CHEM 5651	Materials Chemistry of Renewable Energy
CHEM 5652	Fundamental Science of Photovoltaics
CHME 5204	Heterogeneous Catalysis
CHME 5630	Biochemical Engineering
CIVE 5270	Environmental Protection and Management
EECE 5680	Electric Drives
EECE 5682	Power Systems Analysis 1
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 7239	Special Topics in Power Systems
EECE 7398	Special Topics
EMGT 5220	Engineering Project Management
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
ENSY 5585	Wind Energy Systems
ENSY 7374	Special Topics in Energy Systems
ENSY 7978	Independent Study
ME 5645	Environmental Issues in Manufacturing and Product Use
ME 5685	Solar Thermal Engineering
ME 5690	Gas Turbine Combustion
ME 7270	General Thermodynamics
ME 7300	Combustion and Air Pollution
ME 7305	Fundamentals of Combustion
OR 6205	Deterministic Operations Research
SBSY 5200	Sustainable Engineering Systems for Buildings

Non Technical Electives

A maximum of 5 semester hours may be taken from the following list toward the elective requirement:

ARCH 5210 and ARCH 5211	Environmental Systems and Recitation for ARCH 5210
FINA 6203	Investment Analysis
FINA 6205	Financial Strategy
FINA 6215	Business Turnarounds
PPUA 7238	Climate Change and Urbanization in Developing Countries
or LPSC 7312	Cities, Sustainability, and Climate Change

ONLINE/HYBRID OPTION

Complete 16 semester hours from the following. Electives outside this list may be chosen in consultation with faculty advisor. 16

CIVE 5270	Environmental Protection and Management
EECE 5682	Power Systems Analysis 1
EECE 7398	Special Topics
EMGT 5220	Engineering Project Management
IE 6200	Engineering Probability and Statistics
OR 6205	Deterministic Operations Research
ME 5645	Environmental Issues in Manufacturing and Product Use
ME 5685	Solar Thermal Engineering
ME 7270	General Thermodynamics

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Energy Systems, MSENES—ALIGN Program

Website (http://www.northeastern.edu/align/academic_program/master-of-science-in-energy-systems)

Hameed Metghalchi, Sc.D.
Professor and Program Director
Editor-in-Chief, Journal of Energy Resources Technology
334 Snell Engineering
617.373.2973
m.metghalchi@northeastern.edu

Designing and implementing optimal methods to produce and utilize energy is one of the most pressing global issues today. Finding ways to implement these solutions that are sustainable and marketable is key. The energy systems ALIGN program is meant to provide students of all disciplines with the foundation skills necessary to gain the skills needed to create and implement energy solutions. Students will begin the program by taking two core courses that cover topics across thermosciences and math.

The ALIGN core courses will provide students with an introduction to the fundamentals that are necessary to be successful in the energy system program. Once students complete the ALIGN courses they will move through our multidisciplinary energy systems curriculum that integrates engineering, business, and policy. Our curriculum is flexibly designed with a set of core courses in engineering and finance complemented by a range of electives across five different academic colleges. Our core and elective courses will help to prepare students to lead the efforts to implement energy systems solutions that have a long-term positive effect on businesses and communities.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

ALIGN Course Work

Complete the following (repeatable) course twice:		8
ENSY 7374	Special Topics in Energy Systems	
Core		
EMGT 6225	Economic Decision Making	4
ENSY 5000	Fundamentals of Energy System Integration	4

ME 6200	Mathematical Methods for Mechanical Engineers 1	4
FINA 6309	Foundations of Accounting and Finance	3,4

Options

Complete one of the following options:

GENERAL OPTION

Complete 16 semester hours from the following: 16

CHEM 5651	Materials Chemistry of Renewable Energy
CHEM 5652	Fundamental Science of Photovoltaics
CHME 5204	Heterogeneous Catalysis
CHME 5630	Biochemical Engineering
CIVE 5270	Environmental Protection and Management
EECE 5680	Electric Drives
EECE 5682	Power Systems Analysis 1
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 7239	Special Topics in Power Systems
EECE 7398	Special Topics
EMGT 5220	Engineering Project Management
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
ENSY 5585	Wind Energy Systems
ENSY 7374	Special Topics in Energy Systems
ENSY 7978	Independent Study
ME 5645	Environmental Issues in Manufacturing and Product Use
ME 5685	Solar Thermal Engineering
ME 5690	Gas Turbine Combustion
ME 7270	General Thermodynamics
ME 7300	Combustion and Air Pollution
ME 7305	Fundamentals of Combustion
OR 6205	Deterministic Operations Research
SBSY 5200	Sustainable Engineering Systems for Buildings

Non Technical Electives

A maximum of 5 semester hours may be taken from the following list toward the elective requirement:

ARCH 5210 and ARCH 5211	Environmental Systems and Recitation for ARCH 5210
FINA 6203	Investment Analysis
FINA 6205	Financial Strategy
FINA 6215	Business Turnarounds
PPUA 7238	Climate Change and Urbanization in Developing Countries
or LPSC 7312	Cities, Sustainability, and Climate Change

Online/Hybrid Option

Complete 16 semester hours from the following. Electives outside this list may be chosen in consultation with faculty advisor.

CIVE 5270	Environmental Protection and Management
EECE 5682	Power Systems Analysis 1
EECE 7398	Special Topics
EMGT 5220	Engineering Project Management
IE 6200	Engineering Probability and Statistics
OR 6205	Deterministic Operations Research
ME 5645	Environmental Issues in Manufacturing and Product Use
ME 5685	Solar Thermal Engineering
ME 7270	General Thermodynamics

Program Credit/GPA Requirements

40 total semester hours required
Minimum 3.000 GPA required

Information Systems, MSIS

Website (http://www.coe.neu.edu/degrees/ms-is)

Kal Bugrara, PhD
Senior Program Director

Dana Hall 5th Floor
617.373.4448
kmb@coe.neu.edu

We offer cutting-edge expertise in a variety of courses that combine technological advances and business practices. We stress creative and inventive approaches to problem solving, which necessitates empowering students so that they can take charge of their own software projects to become originally productive. Our Information Systems program is as much an art as a science. It bypasses mechanical learning and highlights the value and excitement of engineering thinking that gets things done efficiently as well as imaginatively. We balance theory and practice, on the premise that they are always intertwined and interdependent.

We seek to provide a basic foundation for our students and then seek to push them to new heights to advance their information technology skills in a way that keeps up and, better yet, exceeds the necessarily fast pace of this progressive field. It is not for us just a question of not being left behind; we strive to be at the forefront of software innovation in an effort to transform contemporary society even more radically than technology has already done—to take gigantic strides in business, medicine, education, and security.

The program offers a number of specializations that reflect current and future industry trends:

- Cryptocurrency and Smart Contract Engineering
- Engineering of Big-Data Systems
- Business Intelligence and Data Analytics
- Cyber-Security Engineering and Development
- Digital Business
- Full-Stack Software Engineering
- User Experience Design

Degree Requirements

A minimum of 32 semester hours must be earned toward completion of the MSIS degree. A minimum grade-point average of 3.000 is required over all courses applied toward the degree.
Students may not register for more than 9 semester hours in the fall and spring terms and 4 semester hours in each of the three summer terms. Any exception must be approved by the Program Director.

The IS program does not accept any transfer credit. All 32 credits must be completed from the IS and CSYE program course work specified.

Seattle Campus

Students can complete this degree at our Seattle campus. Students will have the option to choose from a continually expanding list of electives that are offered strategically to meet industry demand in Seattle.

Graduate Certificate Options

Students enrolled in a graduate degree program in the College of Engineering have the opportunity to pursue an engineering graduate certificate in addition to or in combination with the MS degree. For more information please refer to Graduate Certificate Programs (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Information Systems with Graduate Certificate in Engineering Leadership

Students may complete a master's degree in Information Systems in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16 semester-hour-curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry based challenge project with multiple mentors. The integrated 32 semester hour degree and certificate will require 16 hours of advisor-approved Information Systems technical courses.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

INFO 5100 and INFO 5101	Application Engineering and Development and Lab for INFO 5100	4

Options

Complete one of the following options:

GENERAL OPTION

Complete 28 semester hours from the following subject areas:		28
INFO, CSYE (except CSYE 6220)		

SEATTLE CAMPUS OPTION

Students pursuing the Seattle Campus Option may also take INFO and CSYE courses offered online.

Complete 28 semester hours from the following:		28
CSYE 6225	Network Structures and Cloud Computing	
INFO 6150	Web Design and User Experience Engineering	
INFO 6205	Program Structure and Algorithms	
INFO 6210	Data Management and Database Design	
INFO 6215	Business Analysis and Information Engineering	
INFO 6250	Web Development Tools and Methods	
INFO 6350	Smartphones-Based Web Development	
INFO 7250	Engineering of Big-Data Systems	

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Telecommunications Systems Management, MSTSM

Website (http://www.coe.neu.edu/degrees/ms-tsm)

Peter O'Reilly, PhD
Program Director
Dana Hall 5th Floor
617.373.2636
p.o'reilly@northeastern.edu (p.oreilly@northeastern.edu)

The Master of Science in Telecommunications Systems Management degree is designed for professionals currently in the telecommunications or networking field who either wish to enhance their technical skills and credentials or who wish to make a transition to the business side of telecommunications or networking. We also welcome applications from prospective students with limited industry experience. This program, which may be pursued on a full- or part-time basis, is one of only a very few master's programs in telecommunications and networking in the United States that is truly multidisciplinary, giving students the flexibility to tailor the curriculum to their specific interests, backgrounds, and career goals.

General Degree Requirements

A minimum of 32 semester hours must be earned toward completion of the MSTSM degree. A minimum grade-point average (GPA) of 3.000 is required over all courses applied toward the degree.

To qualify for any degree from the Graduate School of Engineering, a student must attain a GPA of 3.000 or higher with no more than 8 semester hours below the grade of B– in all courses applied toward that degree, exclusive of any prerequisite courses. However, prerequisite courses are calculated into the GPA. The committee on graduate study in engineering allows students to take 8 semester hours of credit beyond stated minimum degree requirements for the purpose of repeating failed required courses or substituting for elective courses in order to attain the required 3.000 GPA for the completion of degree requirements. Within the above limitations for extra or repeated courses, a student must repeat any required course in which he or she earns a grade of C+ or less and earn a grade of B– or better.

DEGREE REQUIREMENTS

The program requires that a mix of core required courses and elective courses be taken. Although there are some dependencies among the core courses, the program may be started in either the fall or spring semester.

Degree Requirements	Full-Time Study	Part-Time Study
Required core courses	16 SH	16 SH
Approved business and technical elective courses	16 SH	16 SH
Minimum Semester Hours Required	**32 SH**	**32 SH**

There are four core courses and a wide range of technical and business electives available. The core courses each carry 4 semester hours of credit. Students must receive a grade of at least a B– in each core course, otherwise they will need to repeat the course. A maximum of two of the core courses may be waived only if a student has taken similar

course material at another university with a satisfactory grade. If a technical core course is waived, it must be replaced with a technical elective. Similarly, if the business core course is waived, it must be replaced with a business elective.

At least one of the electives must be a business elective and at least one must be a technical elective. The technical electives include courses on network and communications technology and on the development of software systems and applications. The business electives are focused on engineering management and entrepreneurship. Electives come from approved lists of courses supplied by the colleges of engineering, business, and computer and information science. All students must take at least one technical elective and one business elective. These electives must be courses of at least 3 semester hours. Students may take elective course work outside these lists only with the prior approval of the program director.

It is expected that students beginning this program will have an adequate background in the following areas: C, C++, or Java programming languages; probability and statistics; and differential and integral calculus.

Students may not register for more than 10 semester hours in the fall and spring terms and 4 semester hours in each of the three summer terms. Any exceptions must be approved by the program director.

Special topics courses, as well as other courses from outside the program, may be used as electives with prior approval of the program director.

All transfer credits must be approved by petition before course enrollment.

Independent Study (TELE 5978), usually 1 or 2 semester hours, or Master's Project (TELE 6945) is sometimes available for students and must be carried out under the supervision of a professor and must have prior approval of the program director. Proposals for Independent Study or a Master's Project need to be submitted at least one month before the start of the semester.

Directed Study (TELE 5976), also for 1 or 2 semester hours, is sometimes available for students. For directed study projects, a student follows a prescribed curriculum, usually with some form of an exam at the end of the semester.

Graduate Certificate Options

Students enrolled in a Master of Science in Telecommunications Systems Management have the opportunity to also pursue one of the many engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 212).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Telecommunications Systems Management with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Telecommunications Systems Management in addition to earning a Graduate Certificate in Engineering Leadership. Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 32-semester-hour degree and certificate require 12 hours of technical core courses from the telecommunications systems management program and 4 hours from the technical course list provided for this program.

Engineering Leadership (p. 205)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core

A grade of B– or higher is required in all core courses.

TELE 5330 and TELE 5331	Data Networking and Lab for TELE 5330	4
TELE 5340	Telecommunications Public Policy and Business Management	4
TELE 5350	Telecom and Network Infrastructure	4
TELE 5360	Internet Protocols and Architecture	4

Electives

A grade of C or higher is required in each elective. At least one course must be taken from the business course list and at least one course from the technical course list.

Complete a minimum of 16 semester hours from the course lists below (p. 203)	16

BUSINESS COURSE LIST

EMGT 5220	Engineering Project Management
EMGT 6225	Economic Decision Making
EMGT 6305	Financial Management for Engineers
ENTR 6200	Enterprise Growth and Innovation
ENTR 6212	Business Planning for New Ventures
ENTR 6218	Business Model Design and Innovation
ENTR 6219	Financing Ventures from Early Stage to Exit
HRMG 6200	Managing People and Organizations
INFO 6245	Planning and Managing Information Systems Development
MGMT 6214	Negotiations
MGSC 6206	Management of Service and Manufacturing Operations
MKTG 6200	Creating and Sustaining Customer Markets
TECE 6222	Emerging and Disruptive Technologies
TECE 6230	Entrepreneurial Marketing and Selling
TECE 6250	Lean Design and Development
TECE 6300	Managing a Technology-Based Business
TELE 6370	Perspectives in Telecommunications Policy
TELE 6380	Consulting Project in Telecommunications
TELE 6600	Special Topics—Telecommunication Policy
TELE 6602	Special Topics—Business

TECHNICAL COURSE LIST

CS 5520	Mobile Application Development
CS 6710	Wireless Network

CS 6740	Network Security
CSYE 6200	Concepts of Object-Oriented Design
CSYE 6225	Network Structures and Cloud Computing
EECE 5576	Wireless Communication Systems
EECE 7364	Mobile and Wireless Networking
IA 5150 and IA 5151	Network Security Practices and Lab for IA 5150
INFO 6210	Data Management and Database Design
INFO 6350	Smartphones-Based Web Development
TELE 5600	Linux/UNIX Systems Management for Network Engineers
TELE 6100	Mobile Wireless Communications and Networking
TELE 6200	Advanced Data Networking
TELE 6350	IP Telephony
TELE 6360	Operation Support Systems in Telecommunications
TELE 6400	Software-Defined Networking
TELE 6601	Special Topics—Systems
TELE 6603	Special Topics—Networking

Program Credit/GPA Requirements

Minimum of 32 total semester hours required
Minimum 3.000 GPA required

Gordon Institute of Engineering Leadership

Website (http://www.northeastern.edu/gordonleadership)

Simon Pitts
Institute Director

415 Stearns Center
617.373.6052
617.373.7680 (fax)

Amy Manley, Program Outreach Specialist, a.manley@northeastern.edu or gordonleadership@northeastern.edu

The Gordon Engineering Leadership Program (GEL) offered by the Gordon Institute of Engineering Leadership is a transformational graduate program designed to build a future corps of engineering leadership professionals. GEL seeks to accelerate leadership development capability in an engineering context through a concentrated curriculum that inculcates both the psychological skills and capabilities needed to lead engineers in parallel with technical skills to successfully engineer products to customers and markets. The program teaches relevant leadership theory followed by practice in leadership laboratories. Technical product development and scientific principles courses are followed by the completion of a market-worthy challenge project. This learning framework is supplemented with three-way mentoring from industry, faculty, and program mentors. Graduates of the program, known as Gordon Fellows, have an opportunity to gain the knowledge, skills, and attitudes required to successfully lead engineering teams. They stand out from their peers in their ability to invent, innovate, and implement engineering projects from concept to market success. Participation in GEL accelerates Gordon Fellows' careers, making them more valuable to their company.

The Challenge

When relatively unseasoned engineers run teams or projects, most fail to satisfy all of the project's critical requirements—missing the mark in functionality, performance, quality, time-to-market, cost, or other key objectives.

This shortfall exists because engineers enter the workforce without critical skills related to:

- Competitiveness
- Taking responsibility to prevent failure
- Market and customer focus
- Influencing and motivating skills
- Interdisciplinary decision making and teamwork capability
- Simultaneous optimization of all elements of performance, quality, cost, and timing
- Front-loading the engineering process
- Financial acumen
- Big-picture engineering
- Leadership abilities and organizational social awareness
- Enterprise understanding
- Program management tools and processes
- Designing to avoid failure modes
- Designing for lean manufacture

The Mission

GEL's mission is to create an elite cadre of engineering leaders who stand out from their peers in their ability to invent, innovate, and implement engineering projects from concept to market success.

These leaders will demonstrate an exceptional ability to lead engineering teams by providing purpose, direction, and motivation to influence others to achieve their collective goals.

The Method

To close the gaps and realize its mission, GEL concentrates on the knowledge, skills, and abilities that reside at the intersection of engineering and leadership.

At the end of the program, Gordon Fellows emerge with the awareness, confidence, vision, and technical dexterity to drive positive change within their organizations and society.

Admissions

GEL candidates must apply for and be admitted to both the Northeastern Graduate School of Engineering and the Gordon Engineering Leadership Program.

Students pursue GEL as part of a Master of Science degree in the engineering discipline of their choice or as a stand-alone graduate certificate. Upon completion of a Master of Science degree, students earn both the Master of Science degree in the discipline of choice and a Graduate Certificate in Engineering Leadership. Students who already hold a graduate degree in engineering or have greater than three years' engineering work experience can complete the program to earn a Graduate Certificate in Engineering Leadership. The core GEL curriculum takes place during one calendar year (September–July), and additional course work required for the Master of Science degree can be pursued before, after, or in parallel with GEL.

Programs

Graduate Certificate: Stand-Alone or Combined with Existing MS Degree

The Graduate Certificate in Engineering Leadership can be pursued as a stand-alone certificate, or the certificate can be earned in conjunction with existing Master of Science degrees offered by the College of Engineering.

Departments across the College of Engineering have developed graduation requirements that enable students to earn both the MS degree and the engineering leadership graduate certificate. Please contact your faculty mentor for details.

REQUIREMENTS

Complete all courses and requirements listed below unless otherwise indicated.

ENLR 5121	Engineering Leadership 1	2
ENLR 5122	Engineering Leadership 2	2
ENLR 5131	Scientific Foundations of Engineering 1	2
ENLR 5132	Scientific Foundations of Engineering 2	2
ENLR 7440	Engineering Leadership Challenge Project 1	4
ENLR 7442	Engineering Leadership Challenge Project 2	4

PROGRAM CREDIT/GPA REQUIREMENTS

16 total semester hours required
Minimum 3.000 GPA required

The following MS programs can be taken in conjunction with the Engineering Leadership Graduate Certificate

- Master of Science in Bioengineering (http://www.northeastern.edu/gordonleadership/degree/ms-in-bioengineering)
- Master of Science in Chemical Engineering (http://www.northeastern.edu/gordonleadership/degree/chemical-engineering)
- Master of Science in Civil Engineering—Select Master of Science concentration (http://www.northeastern.edu/gordonleadership/degree/ms-in-civil-engineering-2)
- Master of Science in Computer Systems Engineering (http://www.northeastern.edu/gordonleadership/degree/computer-systems-engineering)
- Master of Science in Data Analytics Engineering (http://www.northeastern.edu/gordonleadership/degree/ms-in-data-analytics-engineering)
- Master of Science in Electrical and Computer Engineering—Select Master of Science concentration (http://www.northeastern.edu/gordonleadership/degree/electrical-and-computer-engineering)
- Master of Science in Electrical and Computer Engineering Leadership (http://www.northeastern.edu/gordonleadership/degree/electrical-and-computer-engineering-leadership)
- Master of Science in Energy Systems (http://www.northeastern.edu/gordonleadership/degree/energy-systems)
- Master of Science in Engineering and Public Policy with a Concentration in Energy and Environment (http://www.northeastern.edu/gordonleadership/degree/ms-in-engineering-and-public-policy-with-a-concentration-in-energy-environment)
- Master of Science in Engineering and Public Policy with a Concentration in Infrastructure Resilience (http://www.northeastern.edu/gordonleadership/degree/ms-in-engineering-and-public-policy-with-a-concentration-in-infrastructure-resilience)
- Master of Science in Environmental Engineering (http://www.northeastern.edu/gordonleadership/degree/ms-in-environmental-engineering)
- Master of Science in Engineering Management (http://www.northeastern.edu/gordonleadership/degree/engineering-management)
- Master of Science in Industrial Engineering (http://www.northeastern.edu/gordonleadership/degree/industrial-engineering)
- Master of Science in Information Systems (http://www.northeastern.edu/gordonleadership/degree/ms-in-information-systems)
- Master of Science in Mechanical Engineering—Select Master of Science concentration (http://www.northeastern.edu/gordonleadership/degree/mechanical-engineering-2)
- Master of Science in Operations Research (http://www.northeastern.edu/gordonleadership/degree/operationsresearch)
- Master of Science in Sustainable Building Systems (http://www.northeastern.edu/gordonleadership/degree/ms-in-sustainable-building-systems)
- Master of Science in Telecommunication Systems Management (http://www.northeastern.edu/gordonleadership/degree/ms-in-telecommunication-systems-management)

For engineering leadership certificate and MS combined course requirements, please refer to the Certificate and Degree Options (http://www.northeastern.edu/gordonleadership/prospective-students/degree-options) found on the Gordon Institute of Engineering Leadership website.

Engineering Leadership, Graduate Certificate

The Gordon Engineering Leadership Program is a transformational, technical, and challenging graduate-level learning experience targeted for engineering professionals.

The Gordon Institute offers a **Graduate Certificate in Engineering Leadership** as formal recognition of midlevel engineers' leadership acumen and broadened cross-functional capabilities.

Pursuing the graduate certificate allows participants to:

- Take part in a hands-on curriculum taught by industry-experienced professors
- Work with peers from across engineering fields on leadership skills development
- Receive one-on-one mentoring from industry experts and faculty

The Gordon Engineering Leadership Program anchors around an intense, market-worthy challenge project based on your organization's strategic needs. This is a unique opportunity to apply your classroom experience in a professional setting, potentially further accelerating your career.

How to Earn a Graduate Certificate in Engineering Leadership

If you already have a Master of Science, then you can complete the one-year program to earn a Graduate Certificate in Engineering Leadership.

If you do not have a Master of Science, then you can still be considered for the Graduate Certificate in Engineering Leadership if you have at least three years of engineering work experience.

Additional Information can be found on the Gordon Engineering Leadership Program website. (http://www.northeastern.edu/gordonleadership)

Beyond a Graduate Certificate

Most candidates pursue the Gordon Engineering Leadership Program as part of a Master of Science degree in the engineering discipline of their choice. Upon completion, they earn both the Master of Science degree and a Graduate Certificate in Engineering Leadership.

Additional Information on Master of Science degrees in conjunction with a Graduate Certificate in Engineering Leadership can be found here (p. 205).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

ENLR 5121	Engineering Leadership 1	2
ENLR 5122	Engineering Leadership 2	2
ENLR 5131	Scientific Foundations of Engineering 1	2
ENLR 5132	Scientific Foundations of Engineering 2	2
ENLR 7440	Engineering Leadership Challenge Project 1	4
ENLR 7442	Engineering Leadership Challenge Project 2	4

The following MS programs can be taken in conjunction with the Engineering Leadership Graduate Certificate

- Master of Science in Bioengineering (http://www.northeastern.edu/gordonleadership/degree/ms-in-bioengineering)
- Master of Science in Chemical Engineering (http://www.northeastern.edu/gordonleadership/degree/chemical-engineering)
- Master of Science in Civil Engineering—Select Master of Science concentration (http://www.northeastern.edu/gordonleadership/degree/ms-in-civil-engineering-2)
- Master of Science in Computer Systems Engineering (http://www.northeastern.edu/gordonleadership/degree/computer-systems-engineering)
- Master of Science in Data Analytics Engineering (http://www.northeastern.edu/gordonleadership/degree/ms-in-data-analytics-engineering)
- Master of Science in Electrical and Computer Engineering—Select Master of Science concentration (http://www.northeastern.edu/gordonleadership/degree/electrical-and-computer-engineering)
- Master of Science in Electrical and Computer Engineering Leadership (http://www.northeastern.edu/gordonleadership/degree/electrical-and-computer-engineering-leadership)
- Master of Science in Energy Systems (http://www.northeastern.edu/gordonleadership/degree/energy-systems)
- Master of Science in Engineering and Public Policy with a Concentration in Energy and Environment (http://www.northeastern.edu/gordonleadership/degree/ms-in-engineering-and-public-policy-with-a-concentration-in-energy-environment)
- Master of Science in Engineering and Public Policy with a Concentration in Infrastructure Resilience (http://www.northeastern.edu/gordonleadership/degree/ms-in-engineering-and-public-policy-with-a-concentration-in-infrastructure-resilience)
- Master of Science in Engineering Management (http://www.northeastern.edu/gordonleadership/degree/engineering-management)
- Master of Science in Environmental Engineering (http://www.northeastern.edu/gordonleadership/degree/ms-in-environmental-engineering)
- Master of Science in Industrial Engineering (http://www.northeastern.edu/gordonleadership/degree/industrial-engineering)
- Master of Science in Information Systems (http://www.northeastern.edu/gordonleadership/degree/ms-in-information-systems)
- Master of Science in Mechanical Engineering—Select Master of Science concentration (http://www.northeastern.edu/gordonleadership/degree/mechanical-engineering-2)
- Master of Science in Operations Research (http://www.northeastern.edu/gordonleadership/degree/operationsresearch)
- Master of Science in Sustainable Building Systems (http://www.northeastern.edu/gordonleadership/degree/ms-in-sustainable-building-systems)
- Master of Science in Telecommunication Systems Management (http://www.northeastern.edu/gordonleadership/degree/ms-in-telecommunication-systems-management)

For the Graduate Certificate in Engineering Leadership and MS combined course requirements please refer to the Certificate and Degree Options (http://www.northeastern.edu/gordonleadership/prospective-students/degree-options) found on the Gordon Institute of Engineering Leadership website.

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Interdisciplinary PhD Programs

Sara Wadia-Fascetti, PhD
Associate Dean for Graduate Education

130 Snell Engineering Center
617.373.2711

The Graduate School of Engineering offers an interdisciplinary educational and research approach. PhD students conduct research and collaborate with faculty and students across disciplines to gain both depth and breadth of experience and knowledge in their area of study. Many of the student faculty advisors are jointly appointed across departments and colleges. Additionally, our PhD students have the opportunity to conduct transformative, use-inspired research in one of our multidisciplinary research centers of excellence with the goal of developing novel solutions to solve the engineering grand challenges of the 21st century.

Programs

Doctor of Philosophy (PhD)

- Information Assurance (p. 101)
- Information Assurance—Advanced Entry (p. 102)
- Interdisciplinary Engineering (p. 209)
- Network Science (p. 209)
- Population Health (p. 211)

Information Assurance, PhD

A research-based, interdisciplinary Doctor of Philosophy (PhD) in Information Assurance combines a strong security technical foundation with a security policy and social sciences perspective. It seeks to prepare graduates to advance the state-of-the-art of security in systems, networks, and the internet in industry, academia, and government. The interdisciplinary nature of the program distinguishes it from traditional doctoral degree programs in computer science, engineering, or social sciences and makes it unique in the Boston area.

Students who choose the PhD in information assurance program have a strong desire to purse academic research solving critical cybersecurity challenges facing today's society. The PhD program is a natural path for students in the college's Master of Science in Information Assurance and Cybersecurity (http://www.ccs.neu.edu/graduate/degree-programs/m-s-in-information-assurance)program who want to pursue research and students with bachelor's degrees and an interest in research-focused careers. Students who pursue careers in advancing the state-of-the art of cybersecurity have an opportunity to gain:

- A strong technical foundation in cybersecurity and an interdisciplinary perspective based on policy and social science
- A path to a research-focused career coupled with depth in information assurance research at a leading institution, one of the earliest designees by NSA/DHS as a National Center of Academic Excellence (http://www.nsa.gov/ia/academic_outreach/nat_cae/index.shtml) in Information Assurance Research, Information Assurance/Cyber Defense, and Cyber Operations
- The opportunity to work with and learn from faculty who are recognized internationally for their expertise and contributions in information assurance from Northeastern's College of Computer and Information Science, the Department of Electrical and Computer Engineering, and the College of Social Sciences and Humanities
- Access to research projects at Northeastern's research centers focused on security:
  - The Institute of Information Assurance (IIA) an interdisciplinary research center overseen by both the College of Computer and Information Science and the Department of Electrical and Computer Engineering in the College of Engineering, and the recipient of a National Science Foundation grant to train the country's next-generation cybercorps
  - The International Secure Systems Lab (http://www.iseclab.org), affiliated with Northeastern, a collaborative effort of European and U.S. researchers focused on web security, malware and vulnerability analysis, intrusion detection, and other computer security issues
  - The ALERT Center (http://www.northeastern.edu/alert), where Northeastern is the lead institution, a multiuniversity Department of Homeland Security Center of Excellence involved in research, education, and technology related to threats from explosives

The benefits of the Boston area:

- World-renowned for academic and research excellence, the Boston area is also home to some of the nation's largest Department of Defense contractors and government and independent labs such as MIT Lincoln Lab, MITRE, and Draper Lab

Degree Requirements

The PhD in information assurance degree requires completion of at least 48 semester credit hours beyond a bachelor's degree. Students who enter with an undergraduate degree will typically need four to five years to complete the program, and they will be awarded a master's degree en route to the PhD.

Doctoral Degree Candidacy

A student is considered a PhD degree candidate after completing the core courses with at least a 3.400 grade-point average (GPA) and either publishing a paper in a strong conference or journal or passing an oral exam that is conducted by a committee of three information assurance faculty members and based on paper(s) written by the student.

RESIDENCY

One year of continuous full-time study is required after admission to the PhD candidacy. During this period, the student will be expected to make substantial progress in preparing for the comprehensive examination.

DISSERTATION ADVISING

The doctoral dissertation advising team for each student consists of two information assurance faculty members, one in a technical area. When appropriate, the second faculty advisor will be from the policy/social science area.

DISSERTATION COMMITTEE

A PhD student's dissertation committee consists of the two members of the dissertation advising team plus two others: One is a member of the information assurance faculty, and the other is an external examiner who is knowledgeable about the student's research topic.

COMPREHENSIVE EXAMINATION

A PhD student must submit a written dissertation proposal and present it to the dissertation committee. The proposal should identify the research problem, the research plan, and the potential impact of the research on the field. The presentation of the proposal will be made in an open forum, and the student must successfully defend it before the dissertation committee after the public presentation.

DISSERTATION DEFENSE

A PhD student must complete and defend a dissertation that involves original research in information assurance.

AWARDING OF MASTER'S DEGREES

Students who enter the PhD in information assurance program with a bachelor's degree have the option of obtaining a master's degree from one of the departments participating in the program. To do so, they must meet all of the department's degree requirements.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying exam and area exam
Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

Core Requirement

A cumulative 3.400 GPA is required for the core requirement.

Fundamentals

CS 5700	Fundamentals of Computer Networking	4
or EECE 7336	Digital Communications	
Software		
CS 5770	Software Vulnerabilities and Security	4
Security and Cyberlaw		
IA 5200	Security Risk Management and Assessment	4
CS 6740	Network Security	4
or CS 6750	Cryptography and Communications Security	
IA 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	4

Electives and Specializations

Complete 28 semester hours from the following:		28
Consult faculty advisor for other acceptable courses.		
Track 1: Network/Communication Security		
CS 6710	Wireless Network	
EECE 5666	Digital Signal Processing	
Track 2: System Security		
CS 5600	Computer Systems	
or EECE 7352	Computer Architecture	
CS 6540	Foundations of Formal Methods and Software Analysis	
IA 6120	Software Security Practices	
Track 3 Policy/Society		
CRIM 7242	Terrorism and International Crime	
CRIM 7246	Security Management	
CRIM 7252	White-Collar Crime	
POLS 7341	Security and Resilience Policy	
General Electives		
CS 5500	Managing Software Development	
CS 6140	Machine Learning	
CS 6200	Information Retrieval	
EECE 7204	Applied Probability and Stochastic Processes	
EECE 7205	Fundamentals of Computer Engineering	
EECE 7337	Information Theory	
EECE 7339	Testing and Design for Testability	
EECE 7350	Software Engineering 1	
EECE 7351	Software Engineering 2	
EECE 7357	Fault-Tolerant Computers	
SOCL 7211	Research Methods	
or CS 6350	Empirical Research Methods	

Dissertation

Complete the following (repeatable) course twice:		
IA 9990	Dissertation	
Complete the following (repeatable) course until graduation:		
IA 9996	Dissertation Continuation	

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.000 GPA required

Information Assurance, PhD—Advanced Entry

A research-based, interdisciplinary Doctor of Philosophy (PhD) in Information Assurance combines a strong security technical foundation with a security policy and social sciences perspective. It seeks to prepare graduates to advance the state-of-the-art of security in systems networks and the internet in industry, academia, and government. The interdisciplinary nature of the program distinguishes it from traditional doctoral degree programs in computer science, engineering, or social sciences and makes it unique in the Boston area.

Students who choose the PhD in information assurance program have a strong desire to purse academic research solving critical cybersecurity challenges facing today's society. The PhD program is a natural path for students in the college's Master of Science in Information Assurance and Cybersecurity program who want to pursue research and students with bachelor's degrees and an interest in research-focused careers. Students who pursue careers in advancing the state-of-the art of cybersecurity have an opportunity to gain:

- A strong technical foundation in cybersecurity and an interdisciplinary perspective based on policy and social science
- A path to a research-focused career coupled with depth in information assurance research at a leading institution, one of the earliest designees by NSA/DHS as a National Center of Academic Excellence in Information Assurance Research, Information Assurance/Cyber Defense, and Cyber Operations
- The opportunity to work with and learn from faculty who are recognized internationally for their expertise and contributions in information assurance from Northeastern's College of Computer and Information Science, the Department of Electrical and Computer Engineering, and the College of Social Sciences and Humanities
- Access to research projects at Northeastern's research centers focused on security:
  - The Institute of Information Assurance (IIA), an interdisciplinary research center overseen by both the College of Computer and Information Science and the department of Electrical and Computer Engineering in the College of Engineering, and the recipient of a National Science Foundation grant to train the country's next generation of cybercorps
  - The International Secure Systems Lab, affiliated with Northeastern, a collaborative effort of European and U.S. researchers focused on web security, malware and vulnerability analysis, intrusion detection, and other computer security issues
  - The ALERT Center, where Northeastern is the lead institution, a multiuniversity Department of Homeland Security Center of Excellence involved in research, education, and technology related to threats from explosives

The benefits of the Boston area:

- World renowned for academic and research excellence, the Boston area is also home to some of the nation's largest Department of Defense contractors and government and independent labs such as MIT Lincoln Lab, MITRE, and Draper Lab

Degree Requirements

The PhD in information assurance master entry degree requires completion of at least 16 semester credit hours beyond a bachelor's degree. Students also must complete the required core courses.

Doctoral Degree Candidacy

Refer to the information assurance, PhD, overview for admission to candidacy requirements.

RESIDENCY

Refer to the information assurance, PhD, overview for residency requirements.

DISSERTATION ADVISING

Refer to the information assurance, PhD, overview for dissertation advising requirements.

DISSERTATION COMMITTEE

Refer to the information assurance, PhD, overview for dissertation committee requirements.

COMPREHENSIVE EXAMINATION

Refer to the information assurance, PhD, overview for comprehensive examination requirements.

DISSERTATION DEFENSE

Refer to the information assurance, PhD, overview for dissertation defense and completion requirements.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying exam and area exam
Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

Core Requirement

Complete 16 semester hours of approved course work. A cumulative 3.400 GPA is required for the core requirement. Consult your faculty advisor for acceptable courses.

Dissertation

Complete the following (repeatable) course twice:	
IA 9990	Dissertation
Complete the following (repeatable) course until graduation:	
IA 9996	Dissertation Continuation

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Interdisciplinary Engineering, PhD

Sara Wadia-Fascetti, PhD
Associate Dean for Graduate Education

130 Snell Engineering Center
617.373.2711

The Graduate School of Engineering offers an interdisciplinary Doctor of Philosophy degree involving substantial work in two or more academic departments or disciplines. Those interested in this program of study must submit a detailed proposal of the areas of inquiry and research with their application for admission. Interdisciplinary study requires favorable recommendation by a sponsoring doctoral-degree-granting department and approval by authorized representatives of the graduate committees of the departments appropriate to the disciplines covered under the applicant's proposal. The sponsoring department serves as the student's registration department.

Formation of Interdisciplinary Committee

Students admitted for interdisciplinary study must obtain the consent of a faculty advisor who will direct his or her doctoral dissertation. This advisor, who may or may not be a member of the registration department, will chair the student's interdisciplinary committee. The chair of the registration department, or his or her designee, will then appoint a second member to the committee. These two members will invite one or more additional members or request that the director of the Graduate School of Engineering do so. The committee must represent at least two academic departments or programs, and a majority of the committee members must represent doctoral-degree-granting departments. The chair of the registration department, or his or her designee, will notify the director of the Graduate School of Engineering of the membership of the committee as soon as arrangements are finalized.

Duties of Interdisciplinary Committee

A member of the interdisciplinary committee who is also a member of the registration department will serve as the registration officer to approve course registration for the student. The registration officer will file a copy of the approved course registration with the other committee members and with the graduate committee of the registration department. The interdisciplinary committee is responsible for overseeing the completion of all requirements. The committee must also certify to the registration department and to the Graduate School of Engineering the completion of all requirements for the award of the doctoral degree.

The interdisciplinary committee must assure that the student's program represents standards comparable to those of the registration department and that the program is not so broad that it has inadequate depth in any area. The director of the Graduate School of Engineering may review a student's interdisciplinary program at any time to verify that the student meets program objectives.

Network Science, PhD

David Lazer, PhD
Distinguished Professor
College of Social Sciences and Humanities and College of Computer and Information Science

Network Science Program
177 Huntington Avenue, 10th Floor
617.373.8856
617.373.5884 (fax)
Website (http://www.networkscienceinstitute.org)
networkscience@northeastern.edu

The PhD program in network science aims to enhance our understanding of networks arising from the interplay of human behavior, sociotechnical infrastructures, information diffusion, and biological agents. This is an intrinsically multidisciplinary activity, with members of the network science community representing a wide range of fields including computer science, information science, complexity, physics,

sociology, communication, organizational behavior, political science, and epidemiology. This is an interdisciplinary doctoral program focused on training students in network science across several colleges—including the College of Science, the College of Computer and Information Science, the College of Social Sciences and Humanities, Bouvé College of Health Sciences, the College of Engineering, and the College of Arts, Media and Design—with several research areas, including computational sciences, information sciences, health and life sciences, social sciences, and theoretical physics. See other collaborating colleges' catalog sections for possible concentration courses.

Course work is dependent on a student's area of concentration and subject to prior approval by their faculty advisor. Required course work includes the following: three foundational courses in network science Complex Networks and Applications (PHYS 5116) ; Network Science Data (PHYS 7331); and Dynamical Processes in Complex Networks (PHYS 7335); one of two approved courses (Social Network Analysis or Network Data Mining); 12 semester hours of elective course work defined by their specific track; and two research courses with core faculty of the program. A minimum of 32 credit hours of course work is required, though the graduate program committee may recommend additional course work based on student research interests.

Satisfactory progress in the program will be ongoing and formally evaluated at the end of both the first and second years of the program. Students are expected to maintain a cumulative GPA of 3.000 or better in all course work. Students are not allowed to retake courses. A student who does not maintain the 3.000 GPA, or is not making satisfactory progress on their dissertation research, may be recommended for termination by the graduate program committee.

Each student will have one primary research advisor from the network science doctoral program faculty.

Students will be expected to select their research advisor by the end of the spring semester of their second year in the program.

The dissertation committee consists of at least four members: the dissertation advisor, one additional network science doctoral program faculty member, one member expert in the specific topic of research (can be from outside the university), and one additional tenured/tenure-track faculty member from the concentration department/conferring college. The dissertation advisor must be a full-time tenured or tenure-track member of the Northeastern University faculty. The dissertation committee must be approved by the graduate program committee and constituted no later than the end of the spring semester of the first year of the program. Students may repeat the comprehensive examination once if they are unsuccessful.

Degree Candidacy

A student is considered a PhD candidate upon completion of all required course work with a minimum cumulative GPA of 3.000, satisfactory completion of the qualification exam, and satisfactory completion of the comprehensive exam.

Qualifying Examination

The qualification exam will be an oral examination of the material during the students' course work. The exam will be an hour in length and consist of questions selected by network science faculty who comprise the qualifying examination and dissertation committee. Students will receive 50 to 80 potential questions, which they must be prepared to answer, one month before the exam. The exam will consist of a subset of these questions. The qualifying exam will be offered twice annually, in the fall and spring term. All students are required to initially sit for the exam in the fall, typically in their third year of the PhD program. Students who do not pass the qualifying exam on their first attempt are expected to retake the exam in the spring term. Students may sit for the qualifying exam no more than twice.

Students who fail to complete the qualifying examination but who have completed all the PhD program's required course work with a cumulative GPA of 3.000 or better will be awarded a terminal Master of Science in Network Science degree. Note that no students will be admitted directly into the network science program for receipt of a master's degree.

Comprehensive Examination

Students must submit a written dissertation proposal to the qualifying examination and dissertation committee. The proposal should identify relevant literature, the research problem, the research plan, and the potential impact on the field. A presentation of the proposal will be made in an open forum, and the student must successfully defend it before the qualifying examination and dissertation committee. The comprehensive exam must precede the final dissertation defense by at least one year.

Dissertation Defense

A PhD student must complete and defend a dissertation that involves original research in network science. The dissertation defense must adhere to the College of Science policies.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review
Qualifying exam
Dissertation committee
Dissertation proposal
Dissertation defense

Core Course Work

Networks		
CS 6220	Data Mining Techniques	4
or POLS 7334	Social Networks	
PHYS 5116	Complex Networks and Applications	4
PHYS 7331	Network Science Data	4
PHYS 7335	Dynamical Processes in Complex Networks	4
Research		
Complete the following (repeatable) course twice:		
NETS 8984	Research	1-4

Specialization

Complete 12 semester hours of course work. Areas of specialization include:

COMPUTER SCIENCE

CS 6140	Machine Learning
CS 6220	Data Mining Techniques
CS 6240	Large-Scale Parallel Data Processing
CS 7800	Advanced Algorithms
NETS 7341	Network Economics

POLITICAL SCIENCE

POLS 7200	Perspectives on Social Science Inquiry
POLS 7201	Research Design

POLS 7202	Quantitative Techniques
NETS 7341	Network Economics

EPIDEMIOLOGY

PHTH 5202	Introduction to Epidemiology
PHTH 5224	Social Epidemiology
PHTH 5240	Evaluating Scientific Evidence
NETS 7341	Network Economics

ENGINEERING

EECE 7200	Linear Systems Analysis
EECE 7204	Applied Probability and Stochastic Processes
EECE 7323	Numerical Optimization Methods
EECE 7374	Fundamentals of Computer Networks
NETS 7341	Network Economics

PHYSICS

PHYS 7305	Statistical Physics
PHYS 5318	Principles of Experimental Physics
PHYS 7321	Computational Physics
PHYS 7731	Biological Physics 1

MATH

MATH 7241	Probability 1
MATH 7233	Graph Theory
MATH 7375	Topics in Topology
MATH 7733	Readings in Graph Theory
NETS 7341	Network Economics

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Population Health, PhD

Beth E. Molnar, ScD, SM
Director of the Population Health Program

This program seeks to train students to become public health leaders through simultaneous examination of multiple determinations of health, including social, environmental, nutritional, and behavioral risk factors. Our students investigate the underlying causes of adverse health, including disease, disparities, and disability, through training in core population health disciplines—biostatistics, epidemiology, and health services—together with individual-specific and specialized training in topics related to student research. Importantly, our students are mentored by Northeastern's distinguished faculty, who individually and together conduct innovative, solution-focused research in critical population health topics.

Our population health doctoral students have an opportunity to learn to conduct research that addresses five key health determinants:

1. Social and community context
2. Environment and neighborhoods
3. Health and healthcare delivery
4. Education
5. Economic stability

Our diverse faculty has expertise in numerous population health disciplines, including health services research, health disparities, environmental and social epidemiology, biostatistics, exercise science, medical sociology, public policy, personal health technologies, and mental health. Students have the opportunity to work side by side with faculty in conducting cutting-edge, transdisciplinary research in these fields.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Dissertation committee
Dissertation proposal
Dissertation defense

Requirements

Health Services		
PHTH 5232	Evaluating Healthcare Quality	3
or PHTH 5234	Economic Perspectives on Health Policy	
Population Health		
PHTH 6400	Principles of Population Health 1	3
PHTH 6410	Principles of Population Health 2	3
Epidemiology		
PHTH 5202	Introduction to Epidemiology	3
PHTH 6202	Intermediate Epidemiology	3
Research Ethics		
BIOL 6381	Ethics in Biological Research	2
or PHSC 6212	Research Skills and Ethics	
Research and Analysis		
PHTH 5210	Biostatistics in Public Health	3
PHTH 6210	Applied Regression Analysis	3

Options

Complete one of the following options:

SOCIAL AND ENVIRONMENTAL DETERMINANTS OF HEALTH OPTION

PHTH 5224	Social Epidemiology	3
PHTH 6440	Advanced Methods in Biostatistics	3
PHTH 6800	Causal Inference in Public Health Research	3
Electives		2-4

HEALTH SERVICES AND POLICY OPTION

ECON 5110	Microeconomic Theory	4
PHTH 5234	Economic Perspectives on Health Policy	3
Electives		2-4

Electives

CS 6220	Data Mining Techniques
CS 7280	Special Topics in Database Management
ECON 5110	Microeconomic Theory
ECON 5140	Applied Econometrics

ECON 7200	Topics in Applied Economics
EXSC 5200	Cardiopulmonary Physiology
EXSC 5220	Advanced Exercise Physiology
EXSC 5230	Physical Activity and Exercise: Effects on Musculoskeletal Health and Disease
HINF 5200	Theoretical Foundations in Personal Health Informatics
HRMG 6220	Health Organization Management
PHSC 6216	Human Physiology and Pathophysiology
PHTH 5212	Public Health Administration and Policy
PHTH 5214	Environmental Health
PHTH 5226	Strategic Management and Leadership in Healthcare
PHTH 5228	Advances in Measuring Behavior
PHTH 5230	Global Health
PHTH 5440	Community-Based Participatory Research: Environmental Health
PHTH 5540	Health Education and Program Planning
PHTH 6200	Principles and History of Urban Health
PHTH 6204	Society, Behavior, and Health
PHTH 6208	Urban Community Health Assessment
PHTH 6232	Neighborhood and Public Health
PHTH 6320	Qualitative Methods in Health and Illness
PPUA 7247	Seminar in U.S. Health Policy and Management
SOCL 7257	Contemporary Issues in Sociology
SOCL 7287	Social Movements in Health
STRT 6220	Strategic Management for Healthcare Organizations

Dissertation Courses

Complete the following (repeatable) course twice:

PHTH 9990	Dissertation

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Graduate Certificate Programs

Graduate School of Engineering Certificate Policies and Procedures

This document describes the policies and procedures that apply for graduate certificates offered by the Graduate School of Engineering (GSE).

ADMISSION INTO A GSE GRADUATE CERTIFICATE

Certificate admission requirements for n**on-degree-seeking students** include a minimum 3.000 grade-point average (GPA) and completion of a relevant engineering undergraduate degree. Students without an engineering undergraduate degree should apply to the Graduate Certificate in Technology Systems Management.

In order to be considered admissible to an engineering graduate certificate, **current GSE students** must be in good academic standing. Students on academic probation will not be admitted into a graduate certificate program.

Current engineering PhD students will need to get signoff from their PhD advisor in order to be admitted into a certificate program.

Domestic Student

- May take courses at Boston campus or online

International Student

- May take courses at Boston campus
- May take courses online if student does not live in the United States
- SEVIS rules are followed to determine if an F-1 student is eligible to take an online course
- Visa compliance may restrict eligibility for taking online courses
- For GSE degree-seeking students
  - Students must complete the certificate course work before or in the same semester that they complete their degree course work.
  - I-20 may not be extended due to enrollment in a graduate certificate.
  - Students must be enrolled full-time in course work counting toward their degree program each fall and spring term. Certificate course work *not* counting toward the degree may be taken above and beyond that requirement in fall and spring, if the program allows, and in the summer terms.

CERTIFICATE COURSE WORK MAY BE APPLIED TOWARD A GSE DEGREE

Certificate course work completed by graduate students may be used in some cases toward a Northeastern GSE graduate degree. There are two factors to consider, course eligibility and number of courses allowed to be counted for a certificate program and a degree program, known as "double counting." The number of eligible courses allowed for double counting are specified in the section below.

Course Eligibility

GSE certificate courses may be counted toward an engineering graduate degree if the **degree program** requirements allow for the course. Refer to the specific graduate degree requirements in the university catalog.

Course Double Counting

For most **disciplinary degrees**, students can double count up to two eligible courses for a graduate degree and graduate certificate. For MSIE, MOR, MSME general concentration, and MSChE, students can double count up to four eligible courses (with academic advisor approval for courses).

For all **multidisciplinary degrees**—ES, EM, CSYE, IS, and TSM programs—students can double count up to four eligible courses for a graduate degree and graduate certificate.

Double Counting Across Certificates

Engineering graduate courses may not be double counted across graduate certificates.

BS/MS Students

Engineering graduate courses may not be triple counted for graduate certificate and/or degree programs. Graduate courses that are double counted toward the BS and MS degrees may not be counted toward a graduate certificate.

Graduate Courses Applied to an Undergraduate Degree

Graduate courses that were applied toward an undergraduate degree cannot be double counted for a graduate certificate. Graduate courses completed as an undergraduate that are taken above and beyond the

requirements for the undergraduate degree *may* count toward a graduate certificate.

ACADEMIC STANDING

All certificate-seeking students must meet the GSE requirements of a 3.000 GPA to remain in good standing. Only students who complete the required course work and remain in good standing will be eligible to be awarded a certificate.

CO-OP

Non-degree-seeking students are not eligible to participate in co-op.

Co-op eligibility will reside with the graduate degree program of the degree-seeking student. There are no additional considerations allotted by the certificate program.

APPLYING TO GRADUATE

Students must apply to graduate for their certificate programs. At the beginning of the term that students are planning on graduating from their certificate program or certificate and degree program, students must apply to graduate for the certificate. If a student is graduating with both a certificate and degree program, they must apply to graduate to both the degree and the certificate program separately. The certificate and degree are awarded concurrently, even if the certificate course work is completed prior to the degree course work.

CERTIFICATE TRANSCRIPT

Awarding of a certificate will be noted on the official Northeastern University transcript of students who complete a certificate program.

Programs

The College of Engineering offers numerous graduate certificates that may be completed alone or in combination with an MS degree. Please see the Overview tab for Certificate Policies and Procedures (p. 212) for detailed information regarding College of Engineering graduate certificates.

Chemical Engineering

- Process Safety Engineering (p. 129)

Energy Systems

- Energy Systems (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/energy-systems-graduate-certificate)
- Energy Systems Management (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/energy-systems-management-graduate-certificate)
- Renewable Energy (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/renewable-energy-graduate-certificate)
- Sustainable Energy Systems (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/sustainable-energy-systems-graduate-certificate)

Engineering Management

- Engineering Business (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-business-graduate-certificate)
- Engineering Economic Decision Making (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-economic-decision-making-graduate-certificate)
- Engineering Management (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-management-graduate-certificate)
- Lean Six Sigma (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/lean-six-sigma-graduate-certificate)
- Supply Chain Engineering Management (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/supply-chain-engineering-management-graduate-certificate)
- Technology Systems Management (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/technology-systems-management-graduate-certificate)

Gordon Institute of Engineering Leadership

- Engineering Leadership (p. 205)

Industrial Engineering

- Data Mining Engineering (p. 194)
- Data Analytics Engineering (p. 194)

Telecommunication Systems Management

- IP Telephony Systems (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/ip-telephony-systems-graduate-certificate)
- Broadband Wireless Systems (http://catalog.northeastern.edu/graduate/engineering/multidisciplinary/broadband-wireless-systems-graduate-certificate)

Bouvé College of Health Sciences

Website (http://www.northeastern.edu/bouve/graduate)

Susan L. Parish, PhD, MSW, Dean

Dean's Office
215 Behrakis Health Sciences Center
617.373.3323
617.373.3030 (fax)
Bouve_College_of_Health_Sciences@northeastern.edu

Barbara Guthrie, PhD, RN, FAAN
Associate Dean of Graduate Education
617.373.6977

Graduate Admissions and Student Services Office
123 Behrakis Health Sciences Center
617.373.2708
617.373.4701 (fax)
bouvegrad@northeastern.edu

The Bouvé College of Health Sciences (BCHS) strongly supports the mission of Northeastern University as a practice-oriented, student-centered, urban research institution. The college is committed to the goals of the institution, which include excellence in education, research, scholarship, experiential learning, access to educational opportunity, and a strong professional orientation. Each of the programs within the college supports these aims both individually and collectively.

Graduate programs in the Schools of Nursing and Pharmacy (pharmaceutical sciences and PharmD) and the health professions (including audiology, applied psychology, exercise sciences, physical therapy, physician assistant, public health, speech-language pathology, population health, occupational ergonomics and health) and the interdisciplinary programs of health informatics, data analytics, and personal health informatics incorporate experience in the related field of study. Students have an opportunity to interact with faculty contributing to research advances, as well as with Boston's world-class healthcare and educational institutions, and study in a comprehensive health-sciences college, where interdisciplinary approaches to complex issues reflect professional practice.

The result: At Northeastern, you have an opportunity to acquire the knowledge and capability needed for a lifetime of social contribution and professional achievement.

Academic Policies and Procedures

Health Certification

All new students must complete the University Health Report form following acceptance to the university. These forms may be obtained at the University Health and Counseling Services (UHCS) located at 135 Forsyth Building or downloaded from the UHCS website (http://catalog.northeastern.edu/graduate/health-sciences/academic-policies-procedures/health-certification/%20http://www.northeastern.edu/uhcs/forms). Graduate students may additionally be expected to provide UHCS with proof of a physical exam or statement of good health prior to registration; this may vary among programs.

As a condition of matriculation at Northeastern University, all students are required to submit the completed University Health Report form to UHCS. Graduate students must return the form **no later than one month** prior to entering the university. The health center will block the registration of those who do not file correct forms. All documentation must be signed by a medical doctor, nurse practitioner, or physician assistant.

The Commonwealth of Massachusetts requires all university students to provide documentation of immunity to the following:

- Hepatitis B (series of three immunizations or one positive titre)
- Measles (two immunizations or positive antibody titre)
- Mumps (one immunization or positive antibody titre)
- Rubella (one immunization or positive antibody titre)
- Meningitis (optional; students may decline immunization)
- Tetanus/Diphtheria (immunization within last 10 years)

Graduate students in the Bouvé College of Health Sciences are additionally required to provide documentation of immunity to the following:

- Varicella/chicken pox
- Tuberculin skin test (PPD): within six months of registration

Refer to page two of the University Health Report for further clarification. The University Health Report is to be completed once prior to students beginning their graduate studies; however, some programs in the Bouvé College of Health Sciences may require that students provide proof of physical examination annually. Similarly, some programs may require proof of additional immunities. Consult your program handbook or your program advisor for more information. Medical documentation and health certification are maintained by UHCS. Additional clinical clearance may be required by some programs prior to your presence in any clinical setting.

Practicum/Internship Policies

Students taking practicum courses or doing internships in their field of study may be required to submit certification of health status to each of their clinical placement coordinators. Each program has its own regulations for practicum health clearance. Students should consult their program handbooks or clinical placement coordinator for these requirements. Students who do not present the appropriate health

certification will be blocked from registering for, or attending, practicum until satisfactory evidence is provided. An annual update of the student's health certification is also required in some internships and practica. Students taking practicum courses may also be required to submit to and successfully clear criminal history/background checks (CORI (p. 215)). International nursing students must have a current U.S. nursing license and Social Security number.

Background Checks

An increasing number of clinical sites require background checks for employees as well as students who come to their facilities. Northeastern University students will need to have background checks done *only* if their assigned clinical agency requires it. The most common background check required is the Massachusetts Criminal Offender Record Information (CORI), although some clinical sites require other types of checks, such as drug testing.

Bouvé College contracts with a national company,CastleBranch (https://www.castlebranch.com), to perform these checks. The company provides this service for universities nationwide. Log onto their website to learn more about them.

CastleBranch (https://www.castlebranch.com) charges fees to conduct background checks. The fee varies depending on the type of background check needed. All fees will be paid by the student directly to CastleBranch (https://www.castlebranch.com).

All background check information is confidential. Results are sent to the designated clearance officer for Bouvé College, who is the only person who has access to the results. A student will be contacted by the clearance officer *only* if there is a question about the results. Neither the student nor the clearance officer is required to reveal the actual results of a background check to an on-campus clinical coordinator/clinical placement office, a clinical site, or anyone else at the university.

If an assigned clinical site requires students to have a background check, the on-campus clinical coordinator/clinical placement officer will inform the student of the requirements and provide the student with instructions and a deadline for completing the check. It is crucial that the student complete the check by the deadline given to assure adequate processing time prior to the start of a clinical experience. Failure to complete the check in a timely manner could jeopardize the student's progression in the program.

Liability Insurance

All students on practicum/internship must register each semester while on practicum/internship to be covered by liability insurance. As long as they are registered, all Northeastern University matriculated students in fields of study requiring malpractice insurance are covered under a professional liability insurance for which they pay a yearly fee. This insurance covers injury to third parties by students doing work or professional studies outside Northeastern University premises that are clearly part of their duties. It does not cover willful misconduct. Students or the clinical placement coordinator can request that the institutional audit, compliance, and risk services office send evidence-confirming coverage to their field site. Students should consult their practicum placement officer, program coordinator, and specialization policies for information about further requirements for liability insurance. If you are not sure if your program is covered under this policy, coverage can be verified through the Office of Institutional Audit, Compliance and Risk Services (http://www.northeastern.edu/risk_services) at extension x5997.

Grading

Only letter grades are included in the grade-point average (GPA) of the program. Grades listed as S/U, I, and IP are not included in the GPA.

A course retaken due to failure is included in the GPA if it is passable. The failure grade remains on the Northeastern University transcript but is excluded from the GPA.

Although credit can be transferred, grades transferred from another institution are not calculated in the GPA on the Northeastern University transcript. Therefore, courses repeated due to failure must be completed at Northeastern.

Transfer of Credit

A maximum of 9 semester/12 quarter hours of credit obtained at another institution may be accepted toward the degree, provided the credits consist of work taken at the graduate level for graduate credit, carry grades of 3.000 or better, have been earned at an accredited institution, have not been used toward any other degree, and are completed prior to the last semester of graduate study. These courses must have been taken within five years prior to the transfer and cannot be taken in the last semester prior to graduation.

The exact requirements for fulfillment of a degree in the Bouvé College of Health Sciences graduate school vary by program. Students must consult their individual academic program catalogs and policies, as well as program directors, if applicable, for specific credit and noncredit requirements necessary to achieve a specific degree.

If the course had been taken prior to matriculation at Bouvé, the student must submit to his or her academic advisor a petition requesting transfer along with the official transcript indicating successful completion of the course to be transferred. Upon obtaining the advisor's approval, the student submits the documentation to the Bouvé graduate office on the appropriate petition form. A student may petition to transfer credit only after matriculation in Bouvé. The Graduate Petition to Transfer Credit form can be found on the Office of the Registrar's website (http://www.northeastern.edu/registrar/form-gs-xfer-cred.pdf).

Courses that have not been taken but will be taken for transfer from another institution must receive preapproval from the student's academic advisor. Students should submit the petition with the course description attached to their advisor for approval and then submit the completed petition to the Bouvé graduate school office.

Graduate courses at the Northeastern University College of Professional Studies (CPS) can be considered for transfer only with prior approval of the academic advisor. Courses taken in the CPS cannot be considered to fulfill full-time requirements for international students. For consideration of financial aid for CPS courses, check with your financial aid officer.

Students may not transfer courses required for the completion of their program in the last semester of their program.

Course Waiver

A student must obtain approval from their academic advisor to waive a course that was taken for credit toward a prior degree. To obtain approval by the academic advisor, the student must provide an official transcript

and a syllabus of the content of the course to the program director, in order to verify equivalency with the course to be waived. The student must submit the signed appropriate petition form to the Bouvé graduate office. If approved to waive the course, the student must take another course in its place for equivalent credit.

Academic Progression

All students should register by the first week of the semester for course work or continuation credit each semester of the academic year (fall, spring, and, where indicated, summer) once they are matriculated as full- or part-time students. All physician assistant students must register all three semesters. If a student does not register for two consecutive semesters, the student's file will be placed in the "inactive" archives and kept there for no longer than five years. Therefore, if a student plans on being absent more than one semester, he or she must notify the Bouvé graduate student office and request a leave of absence via the myNEU web portal.

For information about withdrawal and refund policies, refer to the Student Financial Services website (http://www.northeastern.edu/financialaid/policies).

All degree requirements must be completed within a maximum of seven years of matriculation, although individual academic programs may require completion in a shorter time frame. Each student is responsible for reviewing the requirements for his or her particular program with his or her advisor. A student's failure or inability to register does not extend the amount of time allowed to complete the program. Course credits earned in programs of graduate study are valid for a maximum of seven years unless an extension is granted by the Bouvé associate dean of academic affairs. After establishment of candidacy for the PhD degree, a maximum of five years will be allowed for completion of the degree requirements, unless an extension is granted. In order to progress in clinical courses that are sequenced, students must receive a passing grade in all prior courses in the sequence. In the event that a student fails a clinical course that is not part of a sequence, progression is at the discretion of the student's academic advisor and/or the program director. When a student fails a clinical course that is part of a sequence of courses, the course instructor must notify the Bouvé College graduate office. Course material related to the student's failure (examination reports, clinical reports) must be made available to the student for review.

Student's Academic Standing

Academic standing in the Bouvé College of Health Sciences (BCHS) is determined by the student's grade-point average (GPA) and performance in academic and clinical courses that are required by his or her program. All BCHS students are expected to maintain a cumulative GPA of 3.000 each semester to remain in good academic standing and to progress toward graduation. Students who do not maintain a cumulative GPA of 3.000 each semester will be placed on probation. Additionally, some programs require students to earn a grade of B (3.000) or better in each specified course. (See "Deficiency Information," below.) Students must also earn a grade of B (3.000) or better in graduate courses taken at another institution that are subject to transfer credit.

Deficiency Information by Program

- Audiology: 3.000 GPA and B lowest grade approved
- Applied Psychology: 3.000 GPA and B– lowest grade approved
- Doctor of Pharmacy: 3.000 GPA and C lowest grade approved
- Exercise science: 3.000 GPA and B lowest grade approved
- Health Informatics: 3.000 GPA and B– lowest grade approved
- Nursing: 3.000 GPA and B lowest grade approved (direct entry has exceptions for undergraduate courses taken during the program)
- Physical therapy: 3.000 GPA and C lowest grade approved
- Physician assistant: 3.000 GPA and C lowest grade approved
- Public health: 3.000 GPA and B– lowest grade approved
- Pharmaceutical sciences: 3.000 GPA and C– lowest grade approved
- Speech: 3.000 GPA and B lowest grade approved

Academic Probation Policy

Academic probation is a period of time when a student must address and remediate academic deficiencies. An action plan to clear the deficiency must be developed by the student, the student's academic advisor, and the specific program graduate committee (if applicable). A student placed on probation will receive written notification by the Office of Graduate Student Services. The student's program advisor will also receive notification of probationary status. It is the student's responsibility to write an action plan with his or her advisor. The plan should document how the deficiency will be remediated and it must also include a date by which the deficiency will be cleared. The action plan must be signed by the advisor and the student and returned to the Bouvé Office of Graduate Student Services (123 BK) within one month from the date of the written notification of probation. The student's failure to submit an action plan may be cause for dismissal from the program. The Academic Probation Contract/Plan form will be sent to the student along with the probationary letter via email, but a printed copy can also be picked up at the Office of Graduate Student Services (123 BK). Students may be placed on academic probation based on but not limited to the following deficiencies:

- A cumulative grade-point average (GPA) below 3.000. Students who remain on academic probation for two semesters are subject to termination from their current graduate program.
- In some programs, a grade of B– or lower in a specified course.
- Unsatisfactory final grade in a clinical course, practicum, internship, research course, etc.

A Bouvé College of Health Sciences (BCHS) graduate student may repeat a course only once to achieve a passing grade and may only repeat two courses for the entirety of their program of study. A student may be on probation for only one semester, or until the course is offered again, unless the advisor approves an action plan that specifies a longer, but definite, period. A student may only be placed on probation twice during enrollment in BCHS and must correct all deficiencies, as specified, in each respective action plan during the applicable probationary period. Failure to remediate the deficiency within the agreed-upon time may result in dismissal from the program. During the period of probation, the student must earn a GPA of 3.000 or better each semester, or he or she is subject to dismissal from BCHS. Note that individual graduate programs may have additional requirements that must be included in the probation action plan.

Once the student has regained a GPA of 3.000, earned a grade of B or better in a repeated course, and/or demonstrated satisfactory performance in a clinical course, he or she will be removed from probation.

Deficiency Information by Program

- Audiology: 3.000 GPA and B lowest grade approved
- Applied psychology: 3.000 GPA and B– lowest grade approved

- Exercise science: 3.000 GPA and B lowest grade approved
- Health informatics: 3.000 GPA and B– lowest grade approved
- Nursing: 3.000 GPA and B lowest grade approved (Direct Entry has exceptions for undergraduate courses taken during the program)
- Physical therapy: 3.000 GPA and C lowest grade approved
- Physician assistant: 3.000 GPA and C lowest grade approved
- Public health: 3.000 GPA and B– lowest grade approved
- Pharmaceutical sciences: 3.000 GPA and C– lowest grade approved
- Speech: 3.000 GPA and B lowest grade approved

Applied Psychology

Website (http://www.northeastern.edu/bouve/ap)

Robert Volpe, PhD
Professor & Interim Chair

404 International Village
617.373.7970
617.373.8892 (fax)
caep@northeastern.edu

Graduate programs in the Department of Applied Psychology reflect Northeastern University's tradition of practice-oriented education with an ecological and multicultural focus. Faculty and students come from diverse ethnic and cultural backgrounds, providing an enriching learning experience. The department is a scientist-practitioner-based unit that generates new psychological knowledge through research, and the translation of research, to applications that:

1. Optimize development and learning
2. Promote mental and physical health from birth through the life span

The Bouvé College of Health Sciences emphasizes experiential and field-based learning, interdisciplinary and global knowledge, and integration of science and practice. The Department of Applied Psychology seeks to produce students who are well prepared to become counseling and psychology professionals in a variety of educational, government, community, organizational, and private settings. Our doctoral programs provide excellent educational opportunities for those interested in professional psychology with specialized training for future careers in academic or practice positions as licensed psychologists. As a Bouvé student, you have an opportunity to acquire knowledge and competency needed for a lifetime of personal fulfillment and professional achievement.

Programs

Doctor of Philosophy (PhD)

- Counseling Psychology (p. 217)
- School Psychology (p. 218)

Certificate of Advanced Graduate Studies (CAGS)

- Applied Behavior Analysis (p. 219)
- Counseling Psychology (p. 220)
- School Psychology (p. 222)

Master of Science (MS)

- Applied Behavior Analysis (p. 220)
- College Student Development and Counseling (p. 221)
- School Psychology (p. 222)

Master of Science in Counseling Psychology (MSCP)

- Counseling Psychology (p. 221)

Graduate Certificate

- Applied Behavior Analysis (p. 223)
- Early Intervention (p. 223)

Counseling Psychology, PhD

The Doctor of Philosophy in Counseling Psychology program is accredited by the American Psychological Association (APA). It is designed to train the next generation of mental health professionals. The program offers doctoral education and training in psychology and seeks to prepare students for entry-level practice in counseling psychology. Doctoral-level counseling psychologists conduct research, teach at the university level, supervise students and professionals, consult with community agencies, and provide clinical services to people across the developmental life span. Counseling psychologists also enhance the science of health promotion and health psychology and emphasize community-based interventions. It is the mission of the PhD in Counseling Psychology program to train multiculturally competent counseling psychologists who are clinically adept in multiple settings with a variety of psychological and health-related issues and who are able to conceptualize, conduct, and evaluate research across biological, cultural, and relational systems in numerous social contexts, such as families, schools, neighborhoods, and communities.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Four qualifying examinations—research, ethics, assessment, and intervention
Annual review
Research team
Dissertation proposal
Dissertation defense

Requirements

A grade of B or higher is required in all course work.

Basic Core		
CAEP 6390	History and Systems of Psychology	3
CAEP 6394	Advanced Multicultural Psychology	3
CAEP 7750	Biological Bases of Behavior	3
CAEP 7755	Cognitive and Affective Bases of Behavior	3
CAEP 7756	Social Psychology in an Organizational and Ecological Context	3
Fieldwork		
Complete 8 semester hours from the following:		8
CAEP 7741	Advanced Fieldwork 1	
CAEP 7742	Advanced Fieldwork 2	
CAEP 7743	Advanced Fieldwork 3	
CAEP 7744	Advanced Fieldwork 4	
Clinical Core		
CAEP 6350	Introduction to Cognitive Assessment	3
CAEP 6352	Personality Assessment	3
CAEP 7710	Advanced Clinical Assessment	3

CAEP 7720	Advanced Clinical Interventions	3
CAEP 7758	Doctoral Seminar in Contemporary Theories of Psychotherapy	3
CAEP 7778	Doctoral Seminar: Leadership, Consultation, and Supervision	3
Elective Core		
Complete 3 semester hours from the following. Other electives or alternatives may be chosen in consultation with faculty advisor:		3
CAEP 5200	Motivational Interviewing in a Healthcare Setting	
CAEP 7751	Advanced Clinical Neuropsychology	
CAEP 7723		
CAEP 7771	Research Team Experience 1	
CAEP 7772	Research Team Experience 2	
CAEP 7773	Research Team Experience 3	
CAEP 7774	Research Team Experience 4	
CAEP 7775	Research Team Experience 5	
CAEP 7776	Research Team Experience 6	
CAEP 7976	Directed Study	
CAEP 8553	Advanced Counseling Practicum	
Professional Core		
Complete 6 semester hours from the following:		6
CAEP 7701	Doctoral Seminar in Counseling Psychology (repeatable)	
CAEP 7732	Legal and Ethical Issues in Community and Educational Settings	
Research Core		
CAEP 7711	Measurement: Advanced Psychometric Principles	3
CAEP 7712	Intermediate Statistical Data Analysis Techniques	3
CAEP 7716	Advanced Research and Data Analyses 2	3
Doctoral Internship		
Complete 3 semester hours from the following:		3
CAEP 7798	Doctoral Internship 1	
CAEP 7799	Doctoral Internship 2	

Dissertation

Complete the following (repeatable) course twice:

CAEP 9990	Dissertation	

Program Credit/GPA Requirements

62 total semester hours required
Minimum 3.000 GPA required

School Psychology, PhD

Northeastern University's Doctor of Philosophy in School Psychology program is accredited by the American Psychological Association (APA) and the National Association of School Psychologists (NASP). The program is designed to prepare the next generation of leaders in school psychology. The ecological perspective and scientist-practitioner training model provide the foundation for the program's educational goals. Students have an opportunity to learn how to conduct research, to use research to inform practice, and to contribute to the scientific foundation of professional practice.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated. Students who enter with a master's degree develop an individualized program of study with their advisor, which requires a minimum of 50 semester hours of credit.

Milestones

Comprehensive examination
Annual review
Mentored research project
Dissertation committee
Dissertation proposal
Dissertation defense

Requirements

A grade of B or higher is required in all course work.

Professional Core		
CAEP 6365	Seminar in School Psychology	3
CAEP 7732	Legal and Ethical Issues in Community and Educational Settings	3
Basic Core		
CAEP 6206	Learning Principles	3
CAEP 6218	Infant, Child, and Adolescent Development	3
CAEP 6390	History and Systems of Psychology	3
CAEP 7750	Biological Bases of Behavior	3
CAEP 7755	Cognitive and Affective Bases of Behavior	3
CAEP 7756	Social Psychology in an Organizational and Ecological Context	3
Multicultural Competency Core		
CAEP 6203	Understanding Culture and Diversity	3
CAEP 6394	Advanced Multicultural Psychology	3
Assessment and Intervention Core		
Course Work		
CAEP 6247	Child and Adolesent Psychopathology	3
CAEP 6345	Learning Problems: Educational, Biological, and Ecological Perspectives	3
CAEP 6347	Behavior Management	3
CAEP 6350	Introduction to Cognitive Assessment	3
CAEP 6353	Curriculum-Based Assessment and Instruction	3
CAEP 6354	Social, Emotional, and Behavioral Assessment	3
CAEP 6360	Consultation and Program Evaluation	3
CAEP 6399	Clinical Skills in Counseling Psychology	3
CAEP 6401	Counseling Children and Adolescents in Schools 1	3
CAEP 6402	Counseling Children and Adolescents in Schools 2	3
CAEP 7710	Advanced Clinical Assessment	3
CAEP 7720	Advanced Clinical Interventions	3
Practicum		
CAEP 6400	Prepracticum in School Psychology	1

CAEP 8415	Practicum in School Psychology 1	2
CAEP 8416	Practicum in School Psychology 2	2
Fieldwork		
CAEP 7741	Advanced Fieldwork 1	1,2
CAEP 7742	Advanced Fieldwork 2	1,2
CAEP 7743	Advanced Fieldwork 3	1,2
CAEP 7744	Advanced Fieldwork 4	1,2
Internship		
CAEP 7798	Doctoral Internship 1	1-3
CAEP 7799	Doctoral Internship 2	2
Research Core		
Research Course Work		
CAEP 6202	Research, Evaluation, and Data Analysis	3
CAEP 7711	Measurement: Advanced Psychometric Principles	3
CAEP 7712	Intermediate Statistical Data Analysis Techniques	3
CAEP 7715	Advanced Research and Data Analyses 1	3
CAEP 7716	Advanced Research and Data Analyses 2	3
CAEP 7777	Doctoral Seminar: Program Planning and Evaluation	3
Research Teams		
CAEP 7771	Research Team Experience 1	1
CAEP 7772	Research Team Experience 2	1
CAEP 7773	Research Team Experience 3	1

Dissertation

Complete the following (repeatable) course twice:

CAEP 9990	Dissertation	

Program Credit/GPA Requirements

104 total semester hours required
Minimum 3.000 GPA required

Applied Behavior Analysis, CAGS

The Certificate of Advanced Graduate Study (CAGS) program prepares graduates to assume supervisory behavior analyst roles in schools and agencies and to serve as independent consultants. Additionally, it seeks to give graduates expertise in a specific clinical area related to applied behavior analysis, such as early intervention, public policy, or autism. This program is designed for the student who possesses a graduate degree in either Psychology or Education. The Behavior Analyst Certification Board (BACB) has approved this course sequence as meeting the course requirements for eligibility to take the Board Certified Behavior Analyst (BCBA) examination.

This program includes 6 core courses in behavior analysis that explore the principles and procedures of applied behavior analysis in depth and address its philosophical underpinnings. The 6 core course are followed by 4 additional courses in a specific content area related to behavior analysis. These courses, which are related, explore the related clinical issue in-depth. Students may elect to complete their supervised experience hours by taking Intensive Intensive Practicum in Applied Behavior Analysis 1 (CAEP 8417) and Intensive Practicum in Applied Behavior Analysis 2 (CAEP 8418) in addition to the 10 required courses.

Courses are delivered in an online format. Students attend lectures virtually and view supplementary material on their own schedules, taking advantage of technological advances that promote student learning and increase student-to-instructor and student-to-student communication.

Students take one or two courses each academic term, and courses are offered during the fall, spring, and summer full semesters. Behavior Assessment (CAEP 6327) and Research and Design Methods (CAEP 6328) serve as prerequisite courses to the remaining courses in the program.

Professional Portfolio

The capstone for the program is the professional portfolio. This portfolio, which is compiled electronically, documents the student's acquisition of critical behavioral procedures and competency in critical clinical skills. These skills, each of which is associated with a specific project, include:

- Preference and reinforcer assessment
- Functional assessment of problem behavior
- Task analysis
- Discrete trial
- Stimulus equivalence
- Consequence reinforcement
- Conditioned reinforcement
- Literature review

Each semester, students complete assignments associated with the above clinical skills, and each assignment culminates in professional documents to be included in the student's professional portfolio. A faculty member reviews and signs each assignment in the professional portfolio. The faculty member's signature indicates that the student has achieved the faculty-established standards for the project. Graduates are encouraged to use their professional portfolio when applying for employment.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Basic Core		
CAEP 6327	Behavior Assessment	3
CAEP 6328	Research and Design Methods	3
CAEP 6329	Service Administration	3
CAEP 6331	Advanced Learning Seminar 1	3
CAEP 6334	Applied Programming Seminar 1	3
CAEP 6336	Systematic Inquiry 1	3
Advanced Core		
CAEP 6324	Programmed Learning	3
CAEP 6332	Advanced Learning Seminar 2	3
CAEP 6335	Applied Programming Seminar 2	3
CAEP 6337	Systematic Inquiry 2	3
Specialization Area		
Complete specialization area in consultation with your faculty advisor.		9

Intensive Practicum

Note: The intensive practicum is optional. Consult your faculty advisor.

CAEP 8417	Intensive Practicum in Applied Behavior Analysis 1	2
CAEP 8418	Intensive Practicum in Applied Behavior Analysis 2	2

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Counseling Psychology, CAGS

The Certificate of Advanced Graduate Study (CAGS) in Counseling Psychology is for students with a highly related master's degree seeking to enhance their professional skills. This program does not meet licensure requirements in Massachusetts. It is a 30-semester-hour course of study. This program is individually tailored to fulfill a student's professional focus.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in all course work.

Core Courses		
In consultation with faculty advisor, complete 24 semester hours in the following subject area:		24
CAEP		
Internship		
CAEP 8510	Internship in Counseling Psychology 1	3
CAEP 8511	Internship in Counseling Psychology 2	3

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Applied Behavior Analysis, MS

The Master of Science in Applied Behavior Analysis (ABA) program prepares graduates to assume supervisory behavior analyst roles in schools and service agencies and to serve as independent consultants. The Behavior Analyst Certification Board (BACB) has approved this course sequence as meeting the course requirements for eligibility to take the Board Certified Behavior Analyst (BCBA) examination. While retaining a practitioner focus, this program gives students in-depth knowledge of topics such as conditioned reinforcement, motivational influences on behavior, and errorless teaching procedures. Courses explore the principles and procedures of applied behavior analysis in-depth and address its philosophical underpinnings. With this background, graduates are prepared to address the most complex behavior problems and learning challenges. Students complete 6 core courses, plus an additional 4 courses that extend the student's familiarity with clinical procedures and with the research supporting their use. Students may elect to complete their supervised experience hours by taking Intensive Practicum in Applied Behavior Analysis 1 (CAEP 8417) and Intensive Practicum in Applied Behavior Analysis 2 (CAEP 8418) in addition to the 10 required courses.

Courses are delivered in an online format. Students attend lectures virtually and view supplementary material on their own schedules, taking advantage of technological advances that promote student learning and increase student-to-instructor and student-to-student communication.

Students take one or two courses each academic term, and courses are offered during the fall, spring, and summer full semesters. Behavior Assessment (CAEP 6327) and Research and Design Methods (CAEP 6328) serve as prerequisite courses to the remaining courses in the program.

Professional Portfolio

The capstone for the program is the professional portfolio. This portfolio, which is compiled electronically, documents the student's acquisition of critical behavioral procedures. This portfolio documents the student's behavioral competency in critical clinical skills. These skills, each of which is associated with a specific project, include:

- Preference and reinforce assessment
- Functional assessment of problem behavior
- Task analysis
- Discrete trial
- Stimulus equivalence
- Conditioned reinforcement
- Literature review

Each semester, students complete assignments associated with the above clinical skills, and each assignment culminates in professional documents to be included in the student's professional portfolio. A faculty member reviews and signs each assignment in the professional portfolio. The faculty member's signature indicates that the student has achieved the faculty-established standards for the project. Graduates are encouraged to use their professional portfolio when applying for employment.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Professional Portfolio

- Preference and reinforce assessment
- Functional assessment of problem behavior
- Task analysis
- Discrete trial
- Stimulus equivalence
- Conditioned reinforcement
- Literature review

Requirements

A grade of B or higher is required in each course.

Basic Core		
CAEP 6327	Behavior Assessment	3
CAEP 6328	Research and Design Methods	3
CAEP 6329	Service Administration	3
CAEP 6331	Advanced Learning Seminar 1	3
CAEP 6334	Applied Programming Seminar 1	3
CAEP 6336	Systematic Inquiry 1	3

Advanced Core		
CAEP 6324	Programmed Learning	3
CAEP 6332	Advanced Learning Seminar 2	3
CAEP 6335	Applied Programming Seminar 2	3
CAEP 6337	Systematic Inquiry 2	3

Intensive Practicum

Note: The intensive practicum is optional. Consult your faculty advisor.

CAEP 8417	Intensive Practicum in Applied Behavior Analysis 1	2
CAEP 8418	Intensive Practicum in Applied Behavior Analysis 2	2

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

College Student Development and Counseling, MS

The College Student Development and Counseling program (CSDC) at Northeastern University aims to create mindful, action-oriented leaders, specifically in the fields of higher education and student affairs administration. The program focuses on counseling, college student development, the history and philosophy of the student affairs profession, and the organization and administration of the field. The program offers emerging professionals the opportunity to obtain the academic and experiential background that enables them to design, create, and administer student personnel programs that teach leadership, foster student development, value diversity, and contribute to the academic experiences of college students. It offers a global perspective to the practice of student affairs and student services.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestone

Portfolio

Requirements

A grade of B or higher is required in each course.

Student Affairs Administration		
CAEP 6301	Planning and Administering Student Affairs	3
CAEP 6302	Law and Ethics in Higher Education	3
CAEP 6303	Financial Aspects of Higher Education	3
CAEP 6305	Special Topics in Higher Education	3
CAEP 6235	Vocational, Education, and Career Development	3
College Student Development		
CAEP 6200	Introduction to Counseling: Theory and Process in an Ecological Context	3
CAEP 6203	Understanding Culture and Diversity	3
CAEP 6230	Health Issues in Counseling	3
CAEP 6300	Introduction to College Student Development	3
Professional Practice		
CAEP 6215	Groups: Dynamics and Leadership	3
CAEP 8402	College Student Development Practicum 1	3
CAEP 8403	College Student Development Practicum 2	3
Research and Evaluation		
CAEP 6202	Research, Evaluation, and Data Analysis	3
CAEP 6262	Evaluation and Outcomes Assessment of Community, School, and Health-Related Programs	3

Program Credit/GPA Requirements

42 total semester hours required
Minimum 3.000 GPA required

Counseling Psychology, MSCP

The Master of Science in Counseling Psychology (MSCP) program at Northeastern is committed to the development of competent Licensed Mental Health Counselors (LMHC) through the disciplinary studies and contemporary professional practice of counseling psychology and complies with licensing regulations for mental health counselors in the Commonwealth of Massachusetts. The program is unique in that within the general Master of Science program we offer students a choice of specific specializations in which students have an opportunity to gain additional depth in selected areas.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in all course work.

Required Course Work		
Course Work		
CAEP 6200	Introduction to Counseling: Theory and Process in an Ecological Context	3
CAEP 6201	Introduction to Assessment	3
CAEP 6203	Understanding Culture and Diversity	3
CAEP 6220	Development Across the Life Span	3
CAEP 6235	Vocational, Education, and Career Development	3
CAEP 6242	Psychopathology: Diagnosis and Treatment Planning	3
CAEP 6250	Individual Interventions	3
CAEP 6260	Community Counseling Psychology	3
CAEP 6282	Ethics and Professional Development	3
CAEP 6287	Group Counseling	3
CAEP 6375	Substance Use and Treatment	3
CAEP 6399	Clinical Skills in Counseling Psychology	3
Seminar		
CAEP 6380	Seminar in Feminist Psychology	3
Research		
CAEP 6202	Research, Evaluation, and Data Analysis	3
Clinical Course Work		
Course Work		

CAEP 6338	Clinical Practice Supervision	1-3
Practicum		
CAEP 8401	Practicum in Counseling Psychology	3
Internship		
CAEP 8510	Internship in Counseling Psychology 1	3
CAEP 8511	Internship in Counseling Psychology 2	3
Electives		
Complete 9 semester hours from the following. Other electives or alternatives may be chosen in consultation with faculty advisor:		9
CAEP 6215	Groups: Dynamics and Leadership	
CAEP 6218	Infant, Child, and Adolescent Development	
CAEP 6222	Human Sexuality	
CAEP 6230	Health Issues in Counseling	
CAEP 6286	Family Counseling Interventions	
CAEP 6247	Child and Adolesent Psychopathology	
CAEP 6275	Counseling Strategies for Children and Adolescents	
CAEP 6283	Brief Therapies	
CAEP 6290	Reality Therapy	
CAEP 6370	Seminar in Health Psychology	
CAEP 6390	History and Systems of Psychology	
CAEP 6394	Advanced Multicultural Psychology	
CAEP 7720	Advanced Clinical Interventions	
CAEP 7758	Doctoral Seminar in Contemporary Theories of Psychotherapy	
PHTH 6320	Qualitative Methods in Health and Illness	

Program Credit/GPA Requirements

60 total semester hours required
Minimum 3.000 GPA required

School Psychology, MS/CAGS

Northeastern University's Master of Science/Certificate of Advanced Graduate Study (CAGS) in School Psychology is approved by the National Association of School Psychologists (NASP) and the Massachusetts Department of Elementary and Secondary Education. The overarching purpose of the program is to develop highly competent school psychologists. Some students also choose to specialize in either early intervention or applied behavior analysis. The early intervention training option is designed to prepare school psychologists to work with infants and toddlers and their families in community and related agencies, on interdisciplinary teams, and on the transition to school. The applied behavior analysis training option is designed to prepare school psychologists to address the learning and behavioral needs of children and adolescents with challenging behaviors in school, home, and community settings, including children with autism spectrum disorders.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

MS Requirements

A grade of B or higher is required in all course work.

Clinical/Applied		
CAEP 6201	Introduction to Assessment	3
CAEP 6347	Behavior Management	3
CAEP 6350	Introduction to Cognitive Assessment	3
CAEP 6400	Prepracticum in School Psychology	1
Foundations		
CAEP 6202	Research, Evaluation, and Data Analysis	3
CAEP 6203	Understanding Culture and Diversity	3
CAEP 6206	Learning Principles	3
CAEP 6218	Infant, Child, and Adolescent Development	3
CAEP 6247	Child and Adolesent Psychopathology	3
CAEP 6365	Seminar in School Psychology	3
CAEP 7750	Biological Bases of Behavior	3

CAGS Requirements

A grade of B or higher is required in all course work.

Clinical/Applied		
CAEP 6353	Curriculum-Based Assessment and Instruction	3
CAEP 6354	Social, Emotional, and Behavioral Assessment	3
CAEP 6345	Learning Problems: Educational, Biological, and Ecological Perspectives	3
CAEP 6360	Consultation and Program Evaluation	3
CAEP 6399	Clinical Skills in Counseling Psychology	3
CAEP 6401	Counseling Children and Adolescents in Schools 1	3
CAEP 6402	Counseling Children and Adolescents in Schools 2	3
Research		
Practicum		
CAEP 8415	Practicum in School Psychology 1	2
CAEP 8416	Practicum in School Psychology 2	2
Internship		
CAEP 8501	Internship in School Psychology 1	3
CAEP 8502	Internship in School Psychology 2	3

Optional Concentration

APPLIED BEHAVIOR ANALYSIS

CAEP 6327	Behavior Assessment	3
CAEP 6328	Research and Design Methods	3
CAEP 6329	Service Administration	3
CAEP 6336	Systematic Inquiry 1	3
CAEP 8417	Intensive Practicum in Applied Behavior Analysis 1	2
CAEP 8418	Intensive Practicum in Applied Behavior Analysis 2	2

Optional Specialization

EARLY INTERVENTION

CAEP 5150	Early Intervention: Family Systems	3
CAEP 8425	Early Intervention Practicum 1	2
SLPA 6335	Early Intervention: Assessment and Intervention	3
CAEP 8426	Early Intervention Practicum 2	2

CAEP 6202	Research, Evaluation, and Data Analysis	3

MS/CAGS Program Credit/GPA Requirements

62 total semester hours required
Minimum 3.000 GPA required

Applied Behavior Analysis, Graduate Certificate

The goal of the Graduate Certificate in Applied Behavior Analysis is to prepare graduates to assume supervisory behavior analyst roles in schools and service agencies and to serve as independent consultants. This program is designed for the student who possesses a graduate degree in either psychology or education. The Behavior Analyst Certification Board (BACB) has approved this course sequence as meeting the course requirements for eligibility to take the Board Certified Behavior Analyst (BCBA) examination.

This program includes six core courses in behavior analysis that explore the principles and procedures of applied behavior analysis in depth and address its philosophical underpinnings. Students may elect to complete their supervised experience hours by taking Intensive Practicum in Applied Behavior Analysis 1 (CAEP 8417) and Intensive Practicum in Applied Behavior Analysis 2 (CAEP 8418) in addition to the six required courses.

Courses are delivered in an online format. Students attend lectures virtually and view supplementary material on their own schedules, taking advantage of technological advances that promote student learning and increase student-to-instructor and student-to-student communication.

Students take one or two courses each academic term, and courses are offered during the fall, spring, and summer full semesters. Behavior Assessment (CAEP 6327) and Research and Design Methods (CAEP 6328) serve as prerequisite courses to the remaining courses in the program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Basic Core		
CAEP 6327	Behavior Assessment	3
CAEP 6328	Research and Design Methods	3
CAEP 6329	Service Administration	3
CAEP 6331	Advanced Learning Seminar 1	3
CAEP 6334	Applied Programming Seminar 1	3
CAEP 6336	Systematic Inquiry 1	3

Intensive Practicum

Note: The intensive practicum is optional. Consult your faculty advisor.

CAEP 8417	Intensive Practicum in Applied Behavior Analysis 1	2
CAEP 8418	Intensive Practicum in Applied Behavior Analysis 2	2

Program Credit/GPA Requirements

18 total semester hours required
Minimum 3.000 GPA required

Early Intervention, Graduate Certificate

Northeastern University's Graduate Certificate in Early Intervention program is an interdisciplinary, preservice training program that is designed to fulfill requirements for certification as an early intervention specialist, at the advanced provisional level, as set forth by the Massachusetts Department of Public Health (DPH). The interdisciplinary nature of the program is facilitated by the interaction of students from school psychology, counseling psychology, physical therapy, speech and language pathology, human services, psychology, and other disciplines who participate in the program.

The goals for the early intervention certificate program are:

- To prepare personnel to provide services to infants and toddlers with disabilities, and their families, from linguistically and culturally diverse backgrounds in urban environments
- To prepare personnel who have attained all competencies relative to early intervention, specified by the Massachusetts DPH, and that are consistent with best practice and research
- To prepare personnel in an interdisciplinary manner, drawing from Northeastern University's multidisciplinary resources
- To prepare personnel to function effectively across teams (individualized family service plan teams, community teams, interagency teams) and to understand the roles of their interdisciplinary teammates

The program is delivered in a hybrid format: Classes meet on campus one day each month, and additional course content is delivered through online distance education. The program can be taken alone or integrated with bachelor's, master's, or clinical doctoral degree programs. Personnel who are working in the field may use their work site for field training. Degree-bearing programs incorporate the courses in alternative arrangements (e.g., Master of Science/Certificate of Advanced Graduate Study in School Psychology, Master of Science in Speech-Language Pathology, Master of Science in Counseling Psychology), meaning that some classes stand in place for others. These program plans are worked out with your advisors.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in all courses.

Early Intervention		
CAEP 5150	Early Intervention: Family Systems	3
CAEP 5151	Early Intervention: Infant and Toddler Development, Risk, and Disability	3
CAEP 5152	Early Intervention: Planning and Evaluating Services	3
SLPA 6335	Early Intervention: Assessment and Intervention	3
Practicum		
CAEP 8425	Early Intervention Practicum 1	2
CAEP 8426	Early Intervention Practicum 2	2

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Communication Sciences and Disorders

Website (http://www.northeastern.edu/bouve/slpa)

Ennio Mingolla, PhD
Professor and Chair

Lori Book, PhD, CCC-SLP
Assistant Clinical Professor and SLP Program Director
Sandra Cleveland, AuD, CCC-A
Associate Clinical Professor and AuD Program Director

MS in Speech-Language Pathology Program
226 Forsyth Building
617.373.7577
617.373.2239 (fax)
Lori Book, SLP Program Director, l.book@northeastern.edu

Doctor of Audiology Program
226 Forsyth Building
617.373.2496
617.373.8756 (fax)
Sandra Cleveland, AuD Program Director, sa.cleveland@northeastern.edu

We are a learning community in which faculty and students support each other's learning across the life span. Our department mission is to educate students to the highest levels of professionalism, consistent with American Speech-Language-Hearing Association (ASHA) and Northeastern University accreditation standards and Massachusetts licensure requirements; to provide them with an interprofessional and practice-oriented education in our urban university environment; to provide them with research experiences based on the highest standards of scientific knowledge; to provide them with clinical experiences with clients, patients, and families from a diverse population base using an evidence-informed practice approach; to evaluate their progress using both formative and summative assessment measures.

Our faculty engage in continuous learning both inside and outside the department to be current in recent research and to contribute to that knowledge base. They use, develop, and address in their teaching technology that improves the hearing, communication, respiration, and swallowing skills of individuals at a variety of age and skill levels.

Programs

Master of Science (MS)

- Speech-Language Pathology (p. 224)

Speech-Language Pathology, MS

Adhering to the highest professional standards, the speech-language pathology (SLP) graduate program seeks to prepare future speech-language pathologists for the rigors of clinical practice in educational and healthcare settings. Graduates of the program will influence society in profound ways—for example, enabling children with autism to communicate effectively, relieving adolescents' fears of speaking dysfluently in the classroom, and helping stroke survivors resume activities in which they had previously participated. The comprehensive program of study emphasizes teamwork and interdisciplinary approaches to complex service delivery issues. SLP graduate students acquire the knowledge and skills needed for a lifetime of professional achievement and social contribution.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Speech-Language Disorders		
Requires 31 semester hours:		
SLPA 5201	Diagnostic Testing in Speech-Language Pathology	1
SLPA 6219	Aural Rehabilitation (or elective)	3-4
SLPA 6303	Stuttering	3
SLPA 6304	Augmentative and Alternative Communication	3
SLPA 6305	Articulation and Phonology	3
SLPA 6306	Speech-Language Disorders in Children	3
SLPA 6307	Voice Disorders	3
SLPA 6308	Dysphagia	3
SLPA 6309	Speech-Language Disorders in Adults	3
SLPA 6321	Motor Speech Disorders	3
SLPA 6330	Language Literacy 1	0.5
SLPA 6337	Language Literacy Experiential Program	0.5
SLPA 6338	Language Literacy 2	2
Speech-Language Science		
SLPA 5109	Neurology of Communication	3
SLPA 6301	Speech Science	3
Research		
SLPA 6211	Research and Evidence-Based Practice	3
SLPA 6420	Practical Statistics for Speech-Language Pathology and Audiology	3
Clinical Practicum		
SLPA 6415	Speech-Language Pathology Advanced Clinical Practicum 1	3
SLPA 6416	Speech-Language Pathology Advanced Clinical Practicum 2	2
SLPA 6417	Speech-Language Pathology Advanced Clinical Practicum 3	2
SLPA 6418	Speech-Language Pathology Advanced Clinical Practicum 4	2

Program Credit/GPA Requirements

52 total semester hours required
Minimum 3.000 GPA required

Health Sciences

Website (http://www.northeastern.edu/bouve/hs)

Shan Mohammed, MD, MPH
Clinical Associate Professor & Interim Chair

316 Robinson Hall
617.373.7729
617.373.2968 (fax)

The Department of Health Sciences at the Bouvé College of Health Sciences at Northeastern University provides a unique, transdisciplinary setting that incorporates academics, research, and practice and seeks

to prepare students for a wide range of career paths. We offer engaging undergraduate academic programs that enable students to major or minor in health sciences, as well as several graduate degree programs, including the Master of Public Health focusing in urban health, the Master of Science in Exercise Science with Concentration in Physical Activity and Public Health, the Doctor of Philosophy in Population Health, and several dual-degree programs offered in conjunction with the School of Pharmacy, the School of Law, and the Physician Assistant Program.

Our diverse faculty has expertise in the fields of population health, health disparities, nutritional epidemiology, social epidemiology, exercise science, medical sociology, public policy, personal health technologies, neurodevelopmental disorders, and mental health, among many more. Students have the opportunity to work side by side with faculty in conducting cutting-edge research in these fields. We also have research staff highly skilled in providing unique, specialized dietary assessment services.

In line with Northeastern's commitment to interdisciplinary research and urban engagement, we teach and work closely with many other schools, centers, and departments in the university, including the Institute on Urban Health Research and Practice (IUHRP), the Center for Community Health Education Research and Service (CCHERS), the Social Science Environmental Health Research Institute (SSEHRI), and the Center for Health Policy and Healthcare Research (CHPHR), as well as community agencies and neighborhood health centers in the local Boston area.

Programs

Doctor of Philosophy (PhD)

- Population Health (p. 211)

Master of Science (MS)

- Exercise Science with Concentration in Physical Activity and Public Health (p. 227)

Master of Public Health (MPH)

- Master of Public Health (p. 226)

Dual Degree

- Law and Urban Public Health, JD/MPH (p. 264)
- Pharmacy and Public Health, PharmD/MPH (p. 228)
- Physician Assistant Studies and Master in Public Health, MS/MPH (p. 229)

Graduate Certificate

- Exercise Science for Clinicians (p. 230)

Population Health, PhD

Beth E. Molnar, ScD, SM
Director of the Population Health Program

This program seeks to train students to become public health leaders through simultaneous examination of multiple determinations of health, including social, environmental, nutritional, and behavioral risk factors. Our students investigate the underlying causes of adverse health, including disease, disparities, and disability, through training in core population health disciplines—biostatistics, epidemiology, and health services—together with individual-specific and specialized training in topics related to student research. Importantly, our students are mentored by Northeastern's distinguished faculty, who individually and together conduct innovative, solution-focused research in critical population health topics.

Our population health doctoral students have an opportunity to learn to conduct research that addresses five key health determinants:

1. Social and community context
2. Environment and neighborhoods
3. Health and healthcare delivery
4. Education
5. Economic stability

Our diverse faculty has expertise in numerous population health disciplines, including health services research, health disparities, environmental and social epidemiology, biostatistics, exercise science, medical sociology, public policy, personal health technologies, and mental health. Students have the opportunity to work side by side with faculty in conducting cutting-edge, transdisciplinary research in these fields.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Dissertation committee
Dissertation proposal
Dissertation defense

Requirements

Health Services		
PHTH 5232	Evaluating Healthcare Quality	3
or PHTH 5234	Economic Perspectives on Health Policy	
Population Health		
PHTH 6400	Principles of Population Health 1	3
PHTH 6410	Principles of Population Health 2	3
Epidemiology		
PHTH 5202	Introduction to Epidemiology	3
PHTH 6202	Intermediate Epidemiology	3
Research Ethics		
BIOL 6381	Ethics in Biological Research	2
or PHSC 6212	Research Skills and Ethics	
Research and Analysis		
PHTH 5210	Biostatistics in Public Health	3
PHTH 6210	Applied Regression Analysis	3

Options

Complete one of the following options:

SOCIAL AND ENVIRONMENTAL DETERMINANTS OF HEALTH OPTION

PHTH 5224	Social Epidemiology	3
PHTH 6440	Advanced Methods in Biostatistics	3
PHTH 6800	Causal Inference in Public Health Research	3
Electives		2-4

HEALTH SERVICES AND POLICY OPTION

ECON 5110	Microeconomic Theory	4
PHTH 5234	Economic Perspectives on Health Policy	3
Electives		2-4

Electives

CS 6220	Data Mining Techniques
CS 7280	Special Topics in Database Management
ECON 5110	Microeconomic Theory
ECON 5140	Applied Econometrics
ECON 7200	Topics in Applied Economics
EXSC 5200	Cardiopulmonary Physiology
EXSC 5220	Advanced Exercise Physiology
EXSC 5230	Physical Activity and Exercise: Effects on Musculoskeletal Health and Disease
HINF 5200	Theoretical Foundations in Personal Health Informatics
HRMG 6220	Health Organization Management
PHSC 6216	Human Physiology and Pathophysiology
PHTH 5212	Public Health Administration and Policy
PHTH 5214	Environmental Health
PHTH 5226	Strategic Management and Leadership in Healthcare
PHTH 5228	Advances in Measuring Behavior
PHTH 5230	Global Health
PHTH 5440	Community-Based Participatory Research: Environmental Health
PHTH 5540	Health Education and Program Planning
PHTH 6200	Principles and History of Urban Health
PHTH 6204	Society, Behavior, and Health
PHTH 6208	Urban Community Health Assessment
PHTH 6232	Neighborhood and Public Health
PHTH 6320	Qualitative Methods in Health and Illness
PPUA 7247	Seminar in U.S. Health Policy and Management
SOCL 7257	Contemporary Issues in Sociology
SOCL 7287	Social Movements in Health
STRT 6220	Strategic Management for Healthcare Organizations

Dissertation Courses

Complete the following (repeatable) course twice:

PHTH 9990	Dissertation

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Public Health, MPH

Website (http://www.northeastern.edu/mph)

Shan Mohammed, MD, MPH
Program Director

316 Robinson Hall
617.373.7729

Through innovation in experiential education, research, and service, the Master of Public Health Program in Urban Health at Northeastern University trains diverse and skilled professionals who promote and protect the health of urban communities.

In order to help prepare the next generation of urban public health leaders and professionals, the MPH offers our diverse graduate students an opportunity to:

- Complete your degree 100 percent online, on-ground, or in a hybrid format (combination of both)
- Participate in learning options that meet the needs of the working professional:
  - On-ground courses are offered in the evening (most classes meet once a week from 5:00 to 7:30 p.m.)
  - Enroll as either a full-time or part-time student
- Take elective courses on a wide range of public health topics, including cross-departmental offerings from Northeastern's other colleges (law, business, social sciences, and more)
- Enjoy a supportive learning environment that includes outstanding student mentoring

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in each required course.

Required Courses		
Requires 30 semester hours:		
PHTH 5120	Race, Ethnicity, and Health in the United States	3
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
PHTH 5212	Public Health Administration and Policy	3
PHTH 5214	Environmental Health	3
PHTH 5540	Health Education and Program Planning	3
or PPUA 6509	Techniques of Program Evaluation	
PHTH 6200	Principles and History of Urban Health	3
PHTH 6204	Society, Behavior, and Health	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 6966	Practicum	3
Capstone		
PHTH 6910	Public Health Capstone	3
Electives		
Complete 9 semester hours from the following. In consultation with your faculty advisor, you may complete electives from another discipline:		9
PHTH 5220	Health and Human Rights	
PHTH 5222	Health Advocacy	
PHTH 5224	Social Epidemiology	

PHTH 5226	Strategic Management and Leadership in Healthcare
PHTH 5228	Advances in Measuring Behavior
PHTH 5230	Global Health
PHTH 5232	Evaluating Healthcare Quality
PHTH 5234	Economic Perspectives on Health Policy
PHTH 5240	Evaluating Scientific Evidence
PHTH 5280	Food, Food Policy, and Health
PHTH 5440	Community-Based Participatory Research: Environmental Health
PHTH 5540	Health Education and Program Planning
PHTH 5976	Directed Study
PHTH 6202	Intermediate Epidemiology
PHTH 6210	Applied Regression Analysis
PHTH 6228	Public Health Nutrition
PHTH 6320	Qualitative Methods in Health and Illness
PHTH 6232	Neighborhood and Public Health
PHTH 6400	Principles of Population Health 1
PHTH 6410	Principles of Population Health 2
PHTH 6440	Advanced Methods in Biostatistics
PHTH 6460	Analysis of Messy Data
PHTH 6800	Causal Inference in Public Health Research
PPUA 6509	Techniques of Program Evaluation

Program Credit/GPA Requirements

42 total semester hours required
Minimum 3.000 GPA required

Exercise Science with Concentration in Physical Activity and Public Health, MS

Rui Li, PhD
Program Director

520 Behrakis Health Sciences Center
617.373.2526

The Department of Health Sciences currently offers a Master of Science in Exercise Science with a public health emphasis. The concentration in physical activity and public health recognizes that inactivity is a major public health problem and represents a significant risk factor for many chronic diseases, including heart disease, stroke, hypertension, metabolic syndrome, obesity, type 2 diabetes, and some types of cancer. Moreover, this concentration integrates key competencies for a degree in exercise science recommended by the American College of Sports Medicine (ACSM), including knowledge of exercise physiology and the assessment and development of physical activity and exercise programs for the general and clinical populations. Graduate students seeking this degree are members of the Bouvé College of Health Sciences—a leading national model for education and research in the health, psychosocial, and biomedical sciences, which supports the university's mission of educating students for a life of fulfillment and accomplishment and creating and translating knowledge to meet global and societal needs through interdisciplinary research, urban engagement, experiential learning, and the integration of classroom learning with real-world experience. Faculty in the department are exploring a range of research topics, including acute/chronic effects of exercise, community-based exercise and nutrition interventions, nutrition epidemiology, health disparities, urban public health, and application of technology for measuring and motivating behavior change.

Two unique features of the program are:

- The program offers three pathways of study based on student interests: research, public health, and practice-based pathways. Students take two electives to enhance their knowledge in their selected pathway. These pathways are designed to train students to pursue a terminal degree in exercise science/opportunities in a research setting, federal/private/nonprofit institutions, and clinical setting.
- We offer students internship, practicum, and research opportunities at both on- and off-campus sites. Experiential education is a key component of the program because application of classroom knowledge provides valuable preparation for a career in exercise science.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in all course work.

Exercise Science Core		
EXSC 5200	Cardiopulmonary Physiology	3
EXSC 5210	Physical Activity and Exercise: Prescription, Measurement, and Testing	3
EXSC 5220	Advanced Exercise Physiology	3
EXSC 5230	Physical Activity and Exercise: Effects on Musculoskeletal Health and Disease	3
EXSC 6202	Electrocardiography, Clinical Assessment, and Prescription	3
Public Health Core		
PHTH 5540	Health Education and Program Planning	3
PHTH 6208	Urban Community Health Assessment	3
Research Core		
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
EXSC 6400	Applied Research Methods	3
Electives [1]		
Complete 6 semester hours from the following:		6
HSCI 5230	Clinical Nutrition Applications in Health and Disease	
EXSC 5000 to EXSC 6402		
PHTH 5000 to PHTH 6800		

Program Credit/GPA Requirement

36 total semester hours required
Minimum 3.000 GPA required

[1] Students may choose two courses within one of three areas (public health, practice-based, and research-based) to deepen their knowledge and competency within that area.

Health Data Analytics, MS

The digitization of healthcare systems in clinical settings, in combination with the explosion of personal data collection devices, provides the opportunity of using data for revolutionizing approaches to care at all levels with an emphasis on precision medicine and person-centered care. The ability to take advantage of this "Big Data" opportunity, however, requires expertise at the intersection of health informatics, data science, and computational modeling. The Master of Science in Health Data Analytics is designed to prepare students to succeed in this emerging field. This program offers a strong, competency-based curriculum that addresses data analytics ranging from data acquisition from traditional and emerging data streams, data aggregation methods, data mining algorithms, predictive computational modeling, and visualization techniques. Students can expect to amass a broad and deep understanding of the various methods, software tools, and topical expertise needed to discover meaningful patterns in health-related data and effectively communicate their implications to a number of diverse stakeholders. Successful graduates of the Master of Science in Health Data Analytics will be effective practitioners and leaders in the rapidly developing domain of data analytics with a focus on health and healthcare.

The interdisciplinary Master of Science in Health Data Analytics consists of 12 courses, drawn from the College of Computer and Information Science and the Bouvé College of Health Science; a capstone project; and an ongoing series of seminars on topics in health data analytics. Two tracks will be available to matriculating students: standard and research based.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Analytics/Modeling/Statistics		
DA 5020	Collecting, Storing, and Retrieving Data	4
DA 5030	Introduction to Data Mining/Machine Learning	4
HINF 6400	Introduction to Health Data Analytics	3
PPUA 5301	Introduction to Computational Statistics	4
PPUA 5302	Information Design and Visual Analytics	4
Healthcare		
HINF 5102	Data Management in Healthcare	3
HINF 5105	The American Healthcare System	3
HINF 5XXX Predictive Analytics and Modeling [1]		3
Thesis/Capstone		
Complete either Thesis or Capstone:		3
Thesis		
HINF XXXX Health Data Analytics Thesis [1]		
Capstone		
HINF 7701	Health Informatics Capstone Project	

[1] Please see college administrator for course information.

Electives

At least one course must be chosen from the methods list.

Methods		
Complete 3–6 semester hours from the following:		3-6
PHTH 5240	Evaluating Scientific Evidence	
PHTH 6202	Intermediate Epidemiology	
PHTH 6210	Applied Regression Analysis	
PHTH 6440	Advanced Methods in Biostatistics	
CS 6350	Empirical Research Methods	
CAEP 7712	Intermediate Statistical Data Analysis Techniques	
CAEP 7716	Advanced Research and Data Analyses 2	
Other Electives		
Complete 0–4 semester hours from the following:		0-4
ARTG 5330	Visualization Technologies	
ARTG 6320	Design of Information-Rich Environments	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 5300	Personal Health Interface Design and Development	
HINF 6215	Project Management	
HINF 6220	Database Design, Access, Modeling, and Security	
PHTH 5226	Strategic Management and Leadership in Healthcare	
PHTH 5232	Evaluating Healthcare Quality	
PHTH 5234	Economic Perspectives on Health Policy	

Program Credit/GPA Requirements

37 total semester hours required
Minimum 3.000 GPA required

Health Informatics, MS

See Bouvé College of Health Sciences interdisciplinary programs (p. 98) for curriculum information.

Pharmacy and Public Health, PharmD/MPH

The School of Pharmacy and the Department of Health Sciences offer a combined Doctor of Pharmacy (PharmD) and Master in Public Health (MPH) program.

The combined PharmD/MPH program recognizes and reinforces the importance of public health in pharmacy practice. Central to addressing urban public health concerns, and in particular those associated with racial and ethnic health disparities, the program is committed to building a strong, diverse, and activist public health workforce. The goal of the program is to graduate professionals who are well educated in the complex issues associated with disparate health status and healthcare access. The combined PharmD/MPH program allows qualified and interested students an opportunity to achieve their goal of obtaining a more robust understanding of public health through an MPH degree while also completing their PharmD.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

DOCTOR OF PHARMACY REQUIREMENTS

PHMD 1201	Introduction to Pharmacy Practice	2.5
PHMD 1202	Lab for PHMD 1201	0.5
PHMD 2350	Healthcare Systems	3
PHSC 4501	Pharmacology/Medicinal Chemistry 1	5
PHSC 3411	Pharmaceutics 1	4
PHMD 2310	Educational and Behavioral Interventions in Pharmacy Practice	2
PHMD 2311	Lab for PHMD 2310	0.5
PHSC 4502	Pharmacology/Medicinal Chemistry 2	5
PHSC 3412	Pharmaceutics 2	4
PHSC 3419	Pharmaceutics Laboratory	1
PHMD 5250	Pharmacy Care Management	3
PHSC 3430	Pharmacokinetics and Biopharmaceutics	3
PHSC 2330	Immunology	3
PHMD 4611	Comprehensive Disease Management 1	6
PHMD 4612	Comprehensive Disease Management 1 Seminar	1
PHSC 5360	Anti-Infectives	4
PHMD 5330	Jurisprudence	3
PHMD 4621	Comprehensive Disease Management 2	6
PHMD 4622	Comprehensive Disease Management 2 Seminar	1
PHMD 4623	Comprehensive Disease Management 2 Skills Lab	0.5
PHMD 4631	Comprehensive Disease Management 3	6
PHMD 4632	Comprehensive Disease Management 3 Seminar	1
PHMD 4633	Comprehensive Disease Management 3 Skills Lab	0.5
PHMD 5223	Evidence-Based Medicine	2
PHMD 5438	Advanced Pharmacy Practice Experience Preparatory Seminar 1	0.5
PHMD 4641	Comprehensive Disease Management 4	6
PHMD 4642	Comprehensive Disease Management 4 Seminar	1
PHMD 4643	Comprehensive Disease Management 4 Skills Lab	0.5
PHMD 5270	Economic Evaluation of Pharmaceuticals and Pharmacy Practice	2
PHMD 5439	Advanced Pharmacy Practice Experience Preparatory Seminar 2	0.5
PHMD 4641	Comprehensive Disease Management 4	6
PHMD 4642	Comprehensive Disease Management 4 Seminar	1
PHMD 4643	Comprehensive Disease Management 4 Skills Lab	0.5
PHMD 5270	Economic Evaluation of Pharmaceuticals and Pharmacy Practice	2
PHMD 5439	Advanced Pharmacy Practice Experience Preparatory Seminar 2	0.5
Required Practice Experience		
Complete 36 semester hours of required practice experience:		36
PHMD 6440-PHMD 6474		

MASTER OF PUBLIC HEALTH REQUIREMENTS

Core Requirements		
PHTH 5120	Race, Ethnicity, and Health in the United States	3
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
PHTH 5212	Public Health Administration and Policy	3
PHTH 5214	Environmental Health	3
PHTH 5540	Health Education and Program Planning	3
PHTH 6200	Principles and History of Urban Health	3
PHTH 6204	Society, Behavior, and Health	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 6966	Practicum	3
PHTH 6910	Public Health Capstone	3
Electives		
Complete 9 semester hours in the following subject area:		9
PHTH or approved electives in other subject areas		

Program Credit/GPA Requirements

156 total semester hours required
Minimum 3.000 GPA required

Physician Assistant Studies and Public Health, MS/MPH

The Northeastern University Physician Assistant (PA) program and Department of Health Sciences offer a combined Master of Science in Physician Assistant Studies (MS)/Master in Public Health Program (MPH) program. The combined PA/MPH program allows qualified and interested students an opportunity to achieve their goal of obtaining a more robust understanding of public health through an MPH degree while also completing their Master of Science in Physician Assistant Studies.

Since its inception in 2008, the Northeastern MPH program has distinguished itself from other MPH programs in the area through its unique focus on urban public health. The program's overarching goal is to address urban public health concerns, particularly those associated with racial and ethnic health disparities, in order to build a diverse and activist-oriented public health workforce. The MPH program has a strong commitment to providing a flexible course of study for working professionals. This flexibility allows for easy incorporation into a dual-degree program.

The combined degree that incorporates both programs is designed to help diversify the public health workforce and improve graduates' ability to approach clinical situations with cultural sensitivity and awareness. Successful graduates of the program benefit from having a greater understanding of public health issues in clinical practice, including the racial and ethnic health disparities prevalent in the U.S. healthcare system, as well as a strong grounding in epidemiology, quantitative and qualitative research methods, and the use of scientific evidence, skills critical to many fields of healthcare practice.

This dual degree takes a total of three years to complete (as opposed to four, if each degree were pursued separately), and a total number of 12 credits would be shared between both degrees.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Physician Assistant Requirements

A grade of C or higher is required in each course.

Didactic Courses		
PA 6200	Anatomy and Physiology 1	3
PA 6201	Anatomy and Physiology 2	3
PA 6203	Physical Diagnosis and Patient Evaluation 1	3
PA 6204	Physical Diagnosis and Patient Evaluation 2	3
PA 6205	Pharmacology 1	2
PA 6206	Pharmacology 2	2
PA 6207	Clinical Laboratory and Diagnostic Methods	4
PA 6208	Professional Issues for Physician Assistants	2
PA 6311	Principles of Medicine 1	4
PA 6312	Principles of Medicine 2	4
PA 6313	Principles of Medicine 3	4
PA 6320	Principles of Obstetrics and Gynecology	2
PA 6321	Principles of Surgery	2
PA 6322	Principles of Orthopedics	2
PA 6323	Clinical Neurology	2
PA 6324	Principles of Pediatrics	2
PA 6325	Principles of Psychiatry	2
PA 6326	Aspects of Primary Care	4
PA 6327	Emergency Medicine and Critical Care	2
PA 6328	Aging and Rehabilitation Medicine	2
Clinical Courses		
PA 6400	Applied Study in Medicine	5
PA 6401	Applied Study in Ambulatory Medicine	5
PA 6402	Applied Study in Family Practice	5
PA 6403	Applied Study in Emergency Medicine	5
PA 6404	Applied Study in Obstetrics and Gynecology	5
PA 6405	Applied Study in Pediatrics	5
PA 6406	Applied Study in Surgery	5
PA 6407	Applied Study in Mental Health	5

Master's of Public Health Requirements

A grade of B– or higher is required in each course.

PHTH 5120	Race, Ethnicity, and Health in the United States	3
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
PHTH 5212	Public Health Administration and Policy	3
PHTH 5214	Environmental Health	3
PHTH 5232	Evaluating Healthcare Quality	3
PHTH 5540	Health Education and Program Planning	3
PHTH 6200	Principles and History of Urban Health	3
PHTH 6204	Society, Behavior, and Health	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 6966	Practicum	3
PHTH 6910	Public Health Capstone	3
Electives		
Complete 3 semester hours of approved elective course work.		3

Program Credit/GPA Requirements

133 total semester hours required
Minimum 3.000 GPA required

Exercise Science for Clinicians, Graduate Certificate

The Department of Health Sciences offers a Graduate Certificate of Exercise Science for Clinicians. Exercise training has been shown to be of therapeutic benefit to patients who have chronic diseases, including but not limited to cardiovascular disease, pulmonary disease, and metabolic disorders. Supervised exercises are commonly performed in a variety of settings including hospitals, outpatient clinics, physician's offices, university laboratories, or hospital-based research facilities. Exercise physiologists work in the above settings to create, implement, and evaluate exercise programs. Clinicians, such as physicians and nurses, work with exercise physiologists to prescribe individualized exercise to meet the specific clinical needs of their patients. Understanding the benefits of exercise, and how exercise plays a role in health promotion and disease prevention/intervention, is only a small part of traditional training of physicians and nurses. This Graduate Certificate of Exercise Science for Clinicians will help bridge the knowledge gap between the medical field and the exercise field. Additionally, it will help clinicians understand the role of exercise as a proven powerful medicine and a readily available therapy that has demonstrated a high therapeutic effect in a number of chronic disease states with little to no side effects.

Two important features:

- The curriculum includes course work and experiential learning opportunities for students to develop well-rounded knowledge of the role of physical activity and exercise on health and disease prevention/intervention. It covers knowledge of exercise physiology and exercise testing, assessment, and prescription, all of which are major domains of job tasks for a clinical exercise physiologist required by the American College of Sports Medicine (ACSM).
- Upon successful completion of the curriculum, students will be granted an exercise science for clinicians certificate. Students may also choose to take additional courses and fulfill the program requirements to complete a Master of Science in Exercise Science, which will prepare them for ACSM certification to become a certified clinical exercise physiologist.

Program Requiements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Advanced Physiology		
EXSC 5200	Cardiopulmonary Physiology	3

EXSC 5220	Advanced Exercise Physiology	3
Assessment and Prescription		
EXSC 5210	Physical Activity and Exercise: Prescription, Measurement, and Testing	3
EXSC 6202	Electrocardiography, Clinical Assessment, and Prescription	3
Internship		
Complete the following (repeatable) course twice:		6
EXSC 6300	Internship in Exercise Science	
Elective		
Complete 3 semester hours of electives with approval of program director.		3

Program Credit/GPA Requirements

21 total semester hours required
Minimum 3.000 GPA required

Health Informatics Management and Exchange Graduate Certificate

See Bouvé College of Health Sciences interdisciplinary programs (p. 267), for curriculum information.

Health Informatics Privacy and Security, Graduate Certificate

See Bouvé College of Health Sciences interdisciplinary programs (p. 267) for curriculum information.

Health Informatics Software Engineering Graduate Certificate

See Bouvé College of Health Sciences interdisciplinary programs (p. 267) for curriculum information.

School of Nursing

Website (http://www.northeastern.edu/bouve/nursing)

Nancy P. Hanrahan, RN, PhD, FAAN
Professor and Dean

Janet Rico, MBA, NP-BC, PhD
Associate Clinical Professor and Assistant Dean of Graduate Nursing Programs

211 Robinson Hall
617.373.3521
617.373.2985 (fax)

Susan McDonald, Administrative Coordinator, Academic Programs, s.mcdonald@northeastern.edu

This is an exciting time in healthcare and nursing in particular. According to a recent Gallup Poll, the public ranks nursing as the "most ethical" profession. In contemporary models of healthcare, nurses are considered the critical backbone and life force of the delivery system. What does that mean for those considering nursing as a profession? It means that as a nurse you will carry an awesome responsibility—to improve the health outcomes of patients and their families. It also means that you must be among the best prepared of health professionals. Excellent preparation is just what we seek to offer.

If you are coming to the School of Nursing to earn a master's, PhD, or DNP, your learning will be guided by our senior faculty, nursing leaders who are expert advance practice nurses in their respective specialty areas. Our affiliation with over 100 institutions means that you and the faculty can select the best place for your clinical rotations. *U.S. News & World Report* ranked our nurse anesthesia graduate program in the top 10 in the United States.

You want to change career pathways? We have the Certificate of Advanced Graduate Study (CAGS) that facilitates attainment of a specialty track if you already have an advanced nursing degree. You want research? We have excellent nurse researchers who are working to improve patient care and advance nursing knowledge. Come join nursing at its finest. Northeastern University is a school on the move.

Further information about the specializations can be found under the program name.

Admission Requirement

Admissions requirements (http://www.northeastern.edu/bouve/grad/chart.html) are specific to the program.

Programs

Doctor of Philosophy (PhD)

- Nursing (p. 232)
- Nursing—Advanced Entry (p. 232)

Doctor of Nursing Practice (DNP)

- Doctor of Nursing Practice (p. 233)
- Doctor of Nursing Practice with Concentration in Nurse Anesthesia (p. 233)

Certificate of Advanced Graduate Study (CAGS)

- Adult-Gerontology Nurse Practitioner, Acute Care (p. 234)
- Family Psychiatric Nurse Practitioner (p. 235)
- Neonatal Nurse Practitioner (p. 235)
- Nurse Anesthesia (p. 235)
- Pediatric Nurse Practitioner, Acute Care (p. 236)
- Pediatric Nurse Practitioner, Acute and Primary Care (p. 236)
- Pediatric Nurse Practitioner, Primary Care (p. 236)
- Adult-Gerontology Nurse Practitioner, Primary Care (p. 234)

Master of Science (MS)

- Nursing—Adult-Gerontology Nurse Practitioner, Acute Care (p. 237)
- Nursing—Family Psychiatric Nurse Practitioner (p. 238)
- Nursing—Neonatal Nurse Practitioner (p. 239)
- Nursing—Pediatric Nurse Practitioner, Acute and Primary Care (p. 239)
- Nursing—Pediatric Nurse Practitioner, Primary Care (p. 240)
- Nursing—Adult-Gerontology Nurse Practitioner, Primary Care (p. 237)
- Nursing—Family Nurse Practitioner, Primary Care (p. 238)
- Nursing—Direct Entry (p. 240)
- Nursing Administration (p. 241)
- Nursing Anesthesia (p. 241)

Dual Degree

- Nursing and Business Administration, MS/MBA (p. 242)

Nursing, PhD

Overview

Research

The PhD in nursing program seeks to prepare scholars to be research scientists, educators, and leaders who improve health across the life span with a concentration on urban, vulnerable, and underserved populations. Graduates are expected to lead interdisciplinary research initiatives that advance nursing science through knowledge development and scholarly inquiry.

Students will study with nursing faculty whose research programs address questions that extend across the broad health spectrum, from illness and self-management through health promotion. Collectively, the faculty have expertise in a variety of research interests, such as health issues of women, children, and families; HIV; cancer; mental health; depression; substance abuse; and perinatal injury.

In addition, students will have an opportunity to study with faculty from other Northeastern departments. Our close collaborations with the university's Institute on Urban Health Research, School of Public Policy and Urban Affairs, as well as with several Boston area academic health centers, provide opportunities to work across disciplines and to access populations and sites essential for completing a dissertation. Visit the Northeastern University Faculty Research site (http://www.northeastern.edu/research/faculty-research) for more information.

Program Requirements

Bachelor's Degree Entrance

A bachelor's degree in nursing is preferred. Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual reviews
Comprehensive examination
Dissertation proposal
Dissertation defense

Requirements

A grade of B or higher is required in all course work.

Core Courses		
NRSG 7104	Foundations in Nursing Research	3
NRSG 7700	The Science of Nursing	3
NRSG 7705	Theoretical and Conceptual Foundations in Nursing Science	3
NRSG 7709	Qualitative Research Methods	3
NRSG 7712	Quantitative Research Methods	3
NRSG 7715	Measurement in Clinical Research	3
NRSG 7750	Healthcare of Urban Populations	3
NRSG 7770	Research Colloquium	1
NRSG 7755	Intervention Research: Development, Implementation, and Evaluation	3
Statistics		
PHTH 5210	Biostatistics in Public Health	3
NRSG 5121	Epidemiology and Population Health	3
PHTH 6210	Applied Regression Analysis	3
Research Practicum		
Complete the following (repeatable) course twice:		6
NRSG 9984	Research	
Cognate Courses [1]		
Complete two cognate courses in consultation with your faculty advisor.		6
Electives [2]		
Complete two elective courses in consultation with your faculty advisor.		6

Dissertation

NRSG 9845	Dissertation Seminar 1	3
NRSG 9846	Dissertation Seminar 2	3
Complete the following (repeatable) course twice:		2
NRSG 9990	Dissertation	

Program Credit/GPA Requirements

60 total semester hours required
Minimum 3.000 GPA required

1. Cognates are graduate-level courses that are taken outside the School of Nursing. These courses should provide depth and breadth to the student's dissertation research.
2. Electives may be taken in nursing or in an area related to the student's dissertation research, including appropriate methodology and statistics courses.

Nursing, PhD—Advanced Entry

The PhD program in nursing is designed to prepare scholars to be research scientists, educators, and leaders who seek to improve health across the life span with a concentration on urban, vulnerable, and underserved populations. Graduates are expected to lead interdisciplinary research initiatives that advance nursing science through knowledge development and scholarly inquiry.

Students will study with nursing faculty whose research programs address questions that extend across a broad health spectrum, from illness and self-management through health promotion. Collectively, the faculty have expertise in a variety of research interests, such as health issues of women, children, and families; HIV; cancer; mental health; depression; substance abuse; and perinatal injury.

In addition, students will have an opportunity to study with faculty from other Northeastern departments. Our close collaborations with the university's Institute on Urban Health Research, School of Public Policy and Urban Affairs, as well as with several Boston-area academic health centers, provide opportunities to work across disciplines and to access populations and sites essential for completing a dissertation. Visit the Northeastern University Faculty Research site (http://www.northeastern.edu/research/faculty-research) for more information.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual reviews
Comprehensive examination
Dissertation proposal
Dissertation defense

Requirements

A grade of B or higher is required in all course work.

Core Courses		
NRSG 7700	The Science of Nursing	3
NRSG 7705	Theoretical and Conceptual Foundations in Nursing Science	3
NRSG 7709	Qualitative Research Methods	3
NRSG 7712	Quantitative Research Methods	3
NRSG 7715	Measurement in Clinical Research	3
NRSG 7750	Healthcare of Urban Populations	3
NRSG 7770	Research Colloquium	1
NRSG 7755	Intervention Research: Development, Implementation, and Evaluation	3
Statistics		
PHTH 5210	Biostatistics in Public Health	3
PHTH 6210	Applied Regression Analysis	3
Cognate Courses [1]		
Complete two cognate courses in consultation with your faculty advisor.		6
Research Practicum		
Complete the following (repeatable) course twice:		6
NRSG 9984	Research	

Dissertation Courses

NRSG 9845	Dissertation Seminar 1	3
NRSG 9846	Dissertation Seminar 2	3
Complete the following (repeatable) course twice:		2
NRSG 9990	Dissertation	

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.000 GPA required

[1] Cognates are graduate-level courses that are taken outside the School of Nursing and should provide depth and breadth to the student's area of interest.

Nursing Practice, DNP

The Doctor of Nursing Practice (DNP) is a practice-oriented degree designed to prepare advanced nurses at the highest level of scholarly practice. Keeping pace with the demands of today's changing healthcare environment requires clinical experts who have the knowledge and skills to be effective change agents. Graduates of our DNP program assume clinical and leadership positions as advanced nurses in a variety of roles including clinical experts, nurse executives, community leaders, and professional organization leadership.

The Northeastern University DNP program includes advanced course work in leadership, practice inquiry, population health, informatics, and health policy. Our goal is to prepare the next generation of nurse leaders with a greater breadth of expertise so they can collaborate more effectively with interprofessional partners and provide leadership to enhance quality and safety. The DNP program curriculum is delivered online in a hybrid format.

If you are a registered nurse with at least two years of advanced nursing experience, you may enter the DNP program after completing a master's degree in nursing or, in some cases, a related health field. Applicants who do not hold national certification in one of the four advanced practice registered nurse (APRN) roles must provide evidence of the equivalent of 500 practicum hours in a previous master's program and/or complete a gap analysis.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Core Courses		
NRSG 6300	Healthcare Finance and Marketing	3
NRSG 6306	Health Informatics	3
NRSG 7100	Leadership in Advanced Practice Nursing	3
NRSG 7924	Applied Epidemiology for Advanced Nursing	3
NRSG 7925	Health Policy and Advocacy	3
Capstone Courses		
NRSG 7920	The Steps to Practice Inquiry: Analyze, Evaluate, Synthesize, and Apply the Evidence	3
NRSG 7921	DNP Scholarly Project 1: Design and Ethical Consideration of Practice Application	3
NRSG 7922	DNP Scholarly Project 2: Applying Practice Knowledge—Implementation/ Outcomes	3
NRSG 7923	DNP Scholarly Project 3: Dissemination of Practice Inquiry	3
Elective		
Complete 3 semester hours, selected in consultation with faculty advisor.		3

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Nursing Practice with Concentration in Nurse Anesthesia, DNP

Restricted to students in the United States Army Graduate Program in Anesthesia Nursing (USAGPAN).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Core Courses		
NRSG 5127	Scientific Inquiry and Epidemiological Concepts	3
NRSG 5170	Statistics in Nursing	2
NRSG 5182	Physical Examination and Differential Diagnosis	4
NRSG 5184	Biochemistry for Nurse Anesthesia	4

NRSG 6372	Professional Aspects of Nurse Anesthesia Practice	3
NRSG 7100	Leadership in Advanced Practice Nursing	3
NRSG 7105	Translating Research Evidence into Practice	3
Pharmacology for Nurse Anesthesia		
NRSG 6369	Pharmacology for Nurse Anesthesia 1	5
NRSG 6371	Pharmacology for Nurse Anesthesia 2	4
Anatomy and Physiology		
NRSG 5172	Clinical Anatomy and Physiology 1 for Nurse Anesthesia	6
NRSG 5174	Clinical Anatomy and Physiology 2 for Nurse Anesthesia	5
Healthcare		
NRSG 6302	Health Policy and Law	3
NRSG 6306	Health Informatics	3
NRSG 6308	Healthcare Management	3

Practice, Clinical, Practicum, and Capstone

A grade of B or higher is required in each course.

Fundamentals of Nurse Anesthesia Practice		
NRSG 6375	Fundamentals of Nurse Anesthesia Practice 1	9
NRSG 6379	Fundamentals of Nurse Anesthesia Practice 2	9
Clinical Practicum		
NRSG 7400	Nurse Anesthesia Clinical Practicum 1	5
NRSG 7403	Nurse Anesthesia Clinical Practicum 2	5
NRSG 7406	Nurse Anesthesia Clinical Practicum 3	5
NRSG 7409	Nurse Anesthesia Clinical Practicum 4	5
Role Development		
NRSG 7412	Nurse Anesthesia Role Development 1	6
NRSG 7415	Nurse Anesthesia Role Development 2	6
NRSG 7418	Nurse Anesthesia Role Development 3	6
NRSG 7421	Nurse Anesthesia Role Development 4	6
Capstone		
NRSG 7921	DNP Scholarly Project 1: Design and Ethical Consideration of Practice Application	3
NRSG 7922	DNP Scholarly Project 2: Applying Practice Knowledge—Implementation/ Outcomes	3
NRSG 7923	DNP Scholarly Project 3: Dissemination of Practice Inquiry	3

Program Credit/GPA Requirements

122 total semester hours required
Minimum 3.000 GPA required

Nursing—Adult-Gerontology Nurse Practitioner, Acute Care, CAGS

The adult-gerontology acute-care nurse practitioner program is designed to prepare nurses for advanced-practice roles as clinical experts, managers, educators, and consultants. The program offers advanced study with a major focus on clinical experience and culminates with the Master of Science in Nursing. Students may pursue either full-time or part-time study. Nurses who possess a Master of Science in Nursing are eligible for the Certificate of Advanced Graduate Study (CAGS) in this specialization.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Acute-Care Theory		
NRSG 6220	Nursing Management: Acute Episodic Illness	3
NRSG 6221	Nursing Management: Critical and Chronic Illness	3
NRSG 6241	Acute-Care Concepts in Nursing Practice	3
Acute-Care Practicum		
NRSG 6420	Adult-Gerontology Acute-Care Nursing Practicum 1	2
NRSG 6421	Adult-Gerontology Acute-Care Nursing Practicum 2	4
NRSG 6422	Adult-Gerontology Acute-Care Nursing Practicum 3	4
Electives		
Complete 5 semester hours in the following subject area:		5
NRSG		

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Nursing—Adult-Gerontology Nurse Practitioner, Primary Care, CAGS

This specialization offers nurse practitioners with certification in a different specialty the opportunity to prepare for practice providing high-quality adult primary care services as an adult-gerontology nurse practitioner. Adult-gerontology NPs provide services to individuals across most of the life span in clinics, private practices, home care, long-term care, and day programs. Upon completion of the primary care program, graduates are eligible to sit for the adult-gerontology certification exam.

Program Requirements

Requirements

A grade of B or higher is required in each course.

Adult-Gerontology Core		
NRSG 6249	Health Promotion of Adult/Older Adult	3
NRSG 6253	Primary Care of Adult/Older Adult Health Problems	4
NRSG 6254	Primary Care of Adult/Older Adult Complex Patients	4
Clinical Core		
NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3

NRSG 6115	Health Assessment	3
NRSG 6222	Pharmacology of Adults and Older Adults	2
Adult-Gerontology Nurse Practicum		
NRSG 6449	Health Promotion of Adult/Older Adult Practicum	1
NRSG 6450	Adult/Older Adult Practicum 1	4
NRSG 6451	Adult/Older Adult Practicum 2	4

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Nursing—Family Psychiatric Nurse Practitioner, CAGS

We offer specialized and flexible program options in psychiatric mental health nursing for nurse practitioners (NPs) with certification in another specialty. Classes are offered during the late afternoon and early evening hours to accommodate the multiple responsibilities of adult learners. This is a 24-semester-hour program of study. Upon completion of the psychiatric mental health advanced practice Certificate of Advanced Graduate Study (CAGS) program, graduates are eligible to sit for available national certification exams in their area of practice.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Family Psychiatric Core		
NRSG 6281	Dimensions of Clinical Practice	3
NRSG 6282	Clinical Psychopharmacology	3
NRSG 6283	Psychobiological Bases of Mental Disorders	3
NRSG 6286	Contemporary Psychotherapies—Theory and Practice	3
Family Psychiatric Practicum		
NRSG 6480	Psychiatric Practicum across the Life Span 1	5
NRSG 6481	Psychiatric Practicum across the Life Span 2	5
Elective		
Complete 2 semester hours from the following subject area:		2
NRSG		

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Nursing—Neonatal Nurse Practitioner, CAGS

We offer a certificate of advanced study for experienced nurses who have a master's degree in nursing and want to specialize in neonatal critical care. Applicants are required to have at least two years of level 3 or greater of neonatal intensive care unit (NICU) experience before entering our program; most applicants have greater amounts of relevant experience. One year of full-time study offers the student an opportunity to increase skills and experience and enable the student to sit for the neonatal nurse practitioner certification exam offered by the National Certification Corporation for the obstetric, gynecologic, and neonatal nursing specialties.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Prerequisites

NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3

Requirements

A grade of B or higher is required in all course work.

Clinical Core		
NRSG 6116	Advanced Health Assessment of the Neonate and Infant	3
NRSG 6230	Nursing Management: Critically Ill Neonatal 1	3
NRSG 6231	Nursing Management: Critically Ill Neonatal 2	3
NRSG 6232	Neonatal Pharmacology	2
Neonatal Practicum		
NRSG 6430	Neonatal Clinical Practicum 1	4
NRSG 6431	Neonatal Clinical Practicum 2	4
NRSG 6432	Neonatal Clinical Practicum 3	2
Elective(s)		
Select courses in consultation with faculty advisor.		3
NRSG		

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Nurse Anesthesia, CAGS

If you have already earned a master's degree and seek further preparation in a specialization to qualify for national certification, the Certificate of Advanced Graduate Study is designed to meet your goal. The program is available in all of the specializations and areas of concentration offered within the nursing master's program: neonatal nurse practitioner; acute-care nurse practitioner; primary care (pediatric, adult, family); psychiatric/mental health (adult, pediatric); nursing administration; and nurse anesthesia.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Prerequisites

A grade of B or higher is required in each course.

NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6115	Health Assessment	3

Requirements

A grade of B or higher is required in each course.

Anesthesia Didactic Courses		
NRSG 6320	Role/Practice Issues in Nurse Anesthesia	3
NRSG 6321	Conceptual Basis of Nurse Anesthesia Practice 1	3
NRSG 6322	Conceptual Basis of Nurse Anesthesia Practice 2	3
NRSG 6324	Chemistry and Physics in Anesthesia	3
NRSG 6325	Pharmacotherapeutics in Anesthesia and Critical Care Nursing	2
NRSG 6333	Conceptual Basis of Nurse Anesthesia Practice 3	3
NRSG 6336	Advanced Concepts in Nurse Anesthesia Practice	3
Nurse Anesthesia Clinical Courses		
NRSG 6530	Nurse Anesthesia Practicum 1	2
NRSG 6534	Nurse Anesthesia Practicum 2	4
NRSG 6535	Nurse Anesthesia Practicum 3	4
NRSG 6540	Advanced Clinical Experiences in Nurse Anesthesia 1	1
NRSG 6541	Advanced Clinical Experiences in Nurse Anesthesia 2	1
NRSG 6542	Advanced Clinical Experiences in Nurse Anesthesia 3	1

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Nursing—Pediatric Nurse Practitioner, Acute Care, CAGS

The pediatric acute-care Certificate of Advanced Graduate Study (CAGS) is available for pediatric or family nurse practitioners who wish to be prepared for practice in the pediatric acute-care role. Applicants must have a minimum of one year of work experience in an acute-care setting working with the pediatric population. The program requires 24 credits of study.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in all course work.

Acute-Care Core		
NRSG 6116	Advanced Health Assessment of the Neonate and Infant	3
NRSG 6262	Pediatric Pharmacology	2
NRSG 6267	Care of the Critically Ill Child	4
NRSG 6265	Care of Child/Adolescent Health Problems	4
Acute-Care Practicum		
NRSG 6461	Child/Adolescent Health Problems Practicum	4
NRSG 6463	Care of the Critically Ill Child Practicum	4
Elective		
Complete 3 semester hours from the following subject area:		3
NRSG		

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Nursing—Pediatric Nurse Practitioner, Acute and Primary Care, CAGS

This specialization is designed to prepare nurse practitioners (NPs) prepared in different specialties with the skills needed to care for children who are at risk across the continuum of care. For nearly two decades, our pediatric nurse practitioner (PNP) program has prepared primary care PNPs to provide community-based, culturally sensitive care. More recently, building on our foundation in evidence-based, interdisciplinary, urban healthcare, we expanded the PNP program into acute care. Students may study either full-time or part-time.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Acute and Primary Care Core		
NRSG 5117	Advanced Pharmacology	2
NRSG 6116	Advanced Health Assessment of the Neonate and Infant	3
NRSG 6262	Pediatric Pharmacology	2
NRSG 6267	Care of the Critically Ill Child	4
NRSG 6265	Care of Child/Adolescent Health Problems	4
Acute and Primary Care Practicum		
NRSG 6460	Care of Well Child/Adolescent Health Promotion Practicum	4
NRSG 6461	Child/Adolescent Health Problems Practicum	4
NRSG 6463	Care of the Critically Ill Child Practicum	4
Primary Care		
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6115	Health Assessment	3
NRSG 6264	Care of Well Child/Adolescent Health Promotion	4
NRSG 6275	Urban Families at Risk: A Primary Care Approach	4

Program Credit/GPA Requirements

41 total semester hours required
Minimum 3.000 GPA required

Nursing—Pediatric Nurse Practitioner, Primary Care, CAGS

This program is designed to prepare nurse practitioners (NPs) certified in a different specialty to provide high-quality primary care to children in a variety of settings. For nearly two decades, our pediatric nurse

practitioner (PNP) program has prepared primary care PNPs to provide community-based, culturally sensitive care.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Pediatric Primary Care Core		
NRSG 6264	Care of Well Child/Adolescent Health Promotion	4
NRSG 6265	Care of Child/Adolescent Health Problems	4
NRSG 6275	Urban Families at Risk: A Primary Care Approach	4
Pediatric Care Practicum		
NRSG 6460	Care of Well Child/Adolescent Health Promotion Practicum	4
NRSG 6461	Child/Adolescent Health Problems Practicum	4
Elective		
Complete 4 semester hours from the following subject area:		4
NRSG		

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Nursing—Adult-Gerontology Nurse Practitioner, Acute Care, MS

The adult-gerontology acute-care program seeks to prepare nurses for advanced-practice roles as clinical experts, educators, and consultants. The program provides advanced study with a major focus on clinical experience and culminates with the Master of Science in Nursing. Students may pursue either full-time or part-time study. Nurses who possess an MS in Nursing are eligible for the Certificate of Advanced Graduate Study (CAGS) in this specialization.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Professional Core		
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
Clinical Core		
NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6115	Health Assessment	3
NRSG 6325	Pharmacotherapeutics in Anesthesia and Critical Care Nursing	2
or NRSG 6222	Pharmacology of Adults and Older Adults	
Acute-Care Theory		
NRSG 6220	Nursing Management: Acute Episodic Illness	3
NRSG 6221	Nursing Management: Critical and Chronic Illness	3
NRSG 6241	Acute-Care Concepts in Nursing Practice	3
Acute-Care Practicum		
NRSG 6420	Adult-Gerontology Acute-Care Nursing Practicum 1	2
NRSG 6421	Adult-Gerontology Acute-Care Nursing Practicum 2	4
NRSG 6422	Adult-Gerontology Acute-Care Nursing Practicum 3	4
Research Core		
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2
Elective		
Complete 3 semester hours in the following subject area:		3
NRSG		

Program Credit/GPA Requirements

43 total semester hours required
Minimum 3.000 GPA required

Nursing—Adult-Gerontology Nurse Practitioner, Primary Care, MS

This specialization offers registered nurses with a bachelor's degree the opportunity to prepare for a career providing high-quality adult primary care services as an adult-gerontologic nurse practitioner (NP). Adult-gerontology NPs provide services to individuals across most of the life span in clinics, private practices, home care, long-term care, and day programs. Upon completion of the primary care program, graduates are eligible to sit for the adult-gerontology certification exam.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Professional Core		
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
Primary Adult-Gerontology Nurse Core		
NRSG 6249	Health Promotion of Adult/Older Adult	3
NRSG 6253	Primary Care of Adult/Older Adult Health Problems	4
NRSG 6254	Primary Care of Adult/Older Adult Complex Patients	4
Clinical Core		
NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6115	Health Assessment	3

NRSG 6222	Pharmacology of Adults and Older Adults	2
Adult-Gerontology Nurse Practicum		
NRSG 6449	Health Promotion of Adult/Older Adult Practicum	1
NRSG 6450	Adult/Older Adult Practicum 1	4
NRSG 6451	Adult/Older Adult Practicum 2	4
Research Core		
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2
Elective		
Complete 2 semester hours from the following subject area:		2
NRSG		

Program Credit/GPA Requirements

43 total semester hours required
Minimum 3.000 GPA required

Nursing—Family Psychiatric Nurse Practitioner, MS

We offer specialized and flexible program options in psychiatric mental health nursing. Part-time and full-time programs are available. Classes are offered during the late afternoon and early evening hours to accommodate the multiple responsibilities of adult learners.

- For nurses who have a baccalaureate degree in nursing, the Master of Science (MS) option is a 43-semester-hour program.
- For nurses with master's preparation in other nursing specialties, the Certificate of Advanced Graduate Study (CAGS) option is a 24-semester-hour program.
- For those who wish to pursue a career in nursing and possess a baccalaureate degree or higher in a related (non-nursing) field, a direct-entry program is available.

Upon completion of the psychiatric mental health advanced-practice nursing graduate program curriculum, graduates are eligible to sit for available national certification exams in their area of practice.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Professional Core		
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
Family Psychiatric Core		
NRSG 6281	Dimensions of Clinical Practice	3
NRSG 6282	Clinical Psychopharmacology	3
NRSG 6283	Psychobiological Bases of Mental Disorders	3
NRSG 6286	Contemporary Psychotherapies—Theory and Practice	3
Clinical Core		
NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6115	Health Assessment	3
Family Psychiatric Practicum		
NRSG 6480	Psychiatric Practicum across the Life Span 1	5
NRSG 6481	Psychiatric Practicum across the Life Span 2	5
Research Core		
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2
Elective		
Complete 2 semester hours in the following subject area:		2
NRSG		

Program Credit/GPA Requirements

43 total semester hours required
Minimum 3.000 GPA required

Nursing—Family Nurse Practitioner, Primary Care, MS

The family nurse practitioner program is a specialty track focusing on the primary healthcare of individuals and families. The program is offered in a hybrid format with the majority of the classes delivered online, coupled with live presentation sessions. Students are required to be on campus twice per semester.

Upon completion of the primary care program, graduates are eligible to sit for all national certification exams in their area of practice.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Professional Core Courses		
NRSG 5117	Advanced Pharmacology	2
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6115	Health Assessment	3
Family Core Courses		
NRSG 6390	Family Care of the Adult/Older Adult Patient	4
NRSG 6392	Family Theory	2
NRSG 6393	Family Care of the Pediatric and Adolescent Patient	4
NRSG 6395	Healthcare of Women in Family Practice	2
Clinical Core Courses		
NRSG 6222	Pharmacology of Adults and Older Adults	2
NRSG 6262	Pediatric Pharmacology	2

Family Nurse Practicum		
NRSG 6391	Practicum for NRSG 6390	4
NRSG 6394	Practicum for NRSG 6393	4
NRSG 6396	Practicum for NRSG 6395	4
Research Core Courses		
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2

Program Credit/GPA Requirements

47 total semester hours required
720 clinical hours plus 40 research practicum hours
(60 clinical hours/1 semester credit)
Minimum 3.000 GPA required

Nursing—Neonatal Nurse Practitioner, MS

Applicants are required to have at least two years of level 3 or greater of neonatal intensive care unit (NICU) experience before entering this program; most applicants have greater amounts of relevant experience. The neonatal nurse practitioner (NNP) program builds on the applicant's significant base of nursing knowledge and focuses on advanced nursing knowledge and clinical practice. In this program, students:

- Learn advanced diagnostic reasoning
- Carry out independent management of patients and their families
- Develop the expertise necessary to care for high-risk neonates and their families
- Become proficient at delivery room management of high-risk neonates

Successful graduates are prepared to make independent decisions in level 2 and level 3 NICUs, drawing on their experience and diagnostic abilities to affect lives every day.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Professional Core		
NRSG 5117	Advanced Pharmacology	2
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
NRSG 5126	Pathophysiology for Advanced Practice	3
Clinical Core		
NRSG 6116	Advanced Health Assessment of the Neonate and Infant	3
NRSG 6230	Nursing Management: Critically Ill Neonatal 1	3
NRSG 6231	Nursing Management: Critically Ill Neonatal 2	3
NRSG 6232	Neonatal Pharmacology	2
Neonatal Practicum		
NRSG 6430	Neonatal Clinical Practicum 1	4
NRSG 6431	Neonatal Clinical Practicum 2	4
NRSG 6432	Neonatal Clinical Practicum 3	2
Research Core		
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2
Elective		
Complete 4 semester hours from the following subject area:		4
NRSG		

Program Credit/GPA Requirements

41 total semester hours required
Minimum 3.000 GPA required

Nursing—Pediatric Nurse Practitioner, Acute and Primary Care, MS

This specialization is designed to prepare nurses with the specialized skills needed to care for children who are at risk across the continuum of care. For nearly two decades, our pediatric nurse practitioner (PNP) program has prepared primary care PNPs to provide community-based, culturally sensitive care. More recently, building on our foundation in evidence-based, interdisciplinary, urban healthcare, we expanded the PNP program into acute care. Students may study either full-time or part-time.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Professional Core		
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
Acute and Primary Care Core		
NRSG 6116	Advanced Health Assessment of the Neonate and Infant	3
NRSG 6264	Care of Well Child/Adolescent Health Promotion	4
NRSG 6265	Care of Child/Adolescent Health Problems	4
NRSG 6267	Care of the Critically Ill Child	4
NRSG 6275	Urban Families at Risk: A Primary Care Approach	4
Clinical Core		
NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6115	Health Assessment	3
NRSG 6262	Pediatric Pharmacology	2
Acute and Primary Care Practicum		
NRSG 6460	Care of Well Child/Adolescent Health Promotion Practicum	4
NRSG 6461	Child/Adolescent Health Problems Practicum	4
NRSG 6463	Care of the Critically Ill Child Practicum	4

Research Core		
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2

Program Credit/GPA Requirements

52 total semester hours required
Minimum 3.000 GPA required

Nursing—Pediatric Nurse Practitioner, Primary Care, MS

This specialization is designed to prepare nurses with the specialized skills needed to provide high-quality primary care to children in a variety of settings. For nearly two decades, our pediatric nurse practitioner (PNP) program has prepared primary care PNPs to provide community-based, culturally sensitive care.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Professional Core		
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
Pediatric Primary Care Core		
NRSG 6264	Care of Well Child/Adolescent Health Promotion	4
NRSG 6265	Care of Child/Adolescent Health Problems	4
NRSG 6275	Urban Families at Risk: A Primary Care Approach	4
Clinical Core		
NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6115	Health Assessment	3
NRSG 6262	Pediatric Pharmacology	2
Pediatric Care Practicum		
NRSG 6460	Care of Well Child/Adolescent Health Promotion Practicum	4
NRSG 6461	Child/Adolescent Health Problems Practicum	4
Research Core		
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2

Program Credit/GPA Requirements

41 total semester hours required
Minimum 3.000 GPA required

Nursing—Direct Entry, MS

Part I: Prelicensure

The direct-entry nursing student enters the accelerated master's program as a graduate student. The first 16 months (four semesters) of the program consist of intensive, sequential classes and clinical with combined undergraduate- and graduate-level courses. Students are then prepared to take the National Council Licensure Exam (NCLEX-RN) upon completion of 64 program semester hours. Students earn a Bachelor of Science in Nursing (BSN) after this part of the program. Financial aid will be granted on an undergraduate basis during the prelicensure phase of the program.

RN WORK EXPERIENCE

Once a student becomes a licensed RN, they participate in an online professional practicum for two semesters. The minimum full-time RN experience required for progression into the NP clinical practicums is one to two years, depending on the track. Students may begin core courses such as advanced pharmacology prior to the required one to two years of RN experience with approval from the program director and if it is in their plan of study. Finding RN employment is the responsibility of the student as it is professional nursing experience. Northeastern will help support the student in preparation for the job search. A leave of absence (LOA) may be granted on an individual basis to gain more nursing experience before returning to the master's portion of the program.

Part II: Return to Master's Specialty Tracks

In the master's specialty track, students are required to take professional and research core classes, clinical core, and specialty clinical courses. Full- or part-time academic study is available to students. Most students return to the master's segment of the program, taking course work as a part-time student while continuing to work and increase the amount of RN professional experience. Full-time study, however, is also an option. Completion of the MSN can take four to six semesters depending on the student's pace and specialty track. Upon completion of the required specialty area credits, the student receives a Master of Science degree and is eligible to take the national certification exam in their area of advanced specialty nursing practice. Financial aid is awarded on a graduate basis during this portion of the program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A B or better in the **BSN clinical courses** is highly recommended for progression into the MSN portion of the program. Progression is at the graduate specialty director's discretion.

A B or better is required in **graduate-level courses: Advanced Pharmacology (NRSG 5117), Pathophysiology for Advanced Practice (NRSG 5126), and Health Informatics (NRSG 6306)** .

Core Courses		
NRSG 2210	Influences on Health and Illness: A Nursing Perspective	3
NRSG 2220 and NRSG 2221	Nursing Interventions, Assessment, and Community Care and Lab for NRSG 2220	5
NRSG 3302 and NRSG 3303	Nursing with Women and Families and Clinical for NRSG 3302	5

NRSG 3320 and NRSG 3321	Nursing Care of Adults 1 and Clinical for NRSG 3320	6
NRSG 3323 and NRSG 3324	Intermediate Interventions and Assessment and Lab for NRSG 3323	2
NRSG 3400 and NRSG 3401	Nursing and the Promotion of Mental Health and Clinical for NRSG 3400	5
NRSG 3420 and NRSG 3421	Nursing Care of Adults 2 and Clinical for NRSG 3420	6
NRSG 4502 and NRSG 4503	Nursing Care of the Child and Clinical for NRSG 4502	6
NRSG 4604 and NRSG 4605	Public Health Community Nursing and Clinical for NRSG 4604	5
NRSG 4610	Managing and Leading in Healthcare	4
NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6306	Health Informatics	3
Research and Practicum		
HLTH 5450	Healthcare Research	4
NRSG 4995	Comprehensive Nursing Practicum	5

Program Credit/GPA Requirements

64 total semester hours required
Minimum 3.000 GPA required

Nursing Administration, MS

The graduate program in nursing administration seeks to prepare students for traditional management/administrative careers and emerging leadership roles in quality and safety and health informatics in contemporary healthcare delivery settings. The curriculum offers a strong foundation in complex systems, organizational theory, quality improvement, finance and business, and leadership practice.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher required in all course work.

Professional Core		
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2
Program Core		
NRSG 6300	Healthcare Finance and Marketing	3
NRSG 6302	Health Policy and Law	3
NRSG 6306	Health Informatics	3
NRSG 6344	Healthcare Quality Improvement	3
NRSG 6444	Healthcare Systems and Quality Patient Care	3
NRSG 6510	Nursing Leadership Role Practicum 1	3
NRSG 6520	Nursing Leadership Role Practicum 2	3
Electives		
Complete 6 semester hours from the following:		6
NRSG 6301	Human Resources and Operations	
NRSG 6307	Operational Informatics in Healthcare Organizations	
HINF 6220	Database Design, Access, Modeling, and Security	

Program Credit/GPA Requirements

38 total semester hours required
Minimum 3.000 GPA required

Nursing Anesthesia, MS

The nurse anesthesia program is housed in the Bouvé College of Health Sciences, which encourages interdisciplinary collaboration with other healthcare disciplines. This high level of integration is part of what has made us one of the highest nationally ranked programs in the Northeast in the *U.S. News and World Report* ranking.

Northeastern offers a traditional master's degree, an accelerated master's for certified registered nurse anesthetists (CRNAs), a Certificate of Advanced Graduate Study (CAGS), and participation in the U.S. Army Graduate Program in Nurse Anesthesia.

Students graduate in May each year and are eligible to sit for the national certification examination for nurse anesthetists, administered by the Council on Certification of Nurse Anesthetists.

Northeastern University is accredited by the New England Association of Schools and Colleges, Inc. The School of Nursing is accredited by the Commission on Collegiate Nursing Education (CCNE). The nurse anesthesia program is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs (COA) for the maximum allowable 10 years through May 2024 (Council on Accreditation of Nurse Anesthesia Educational Programs, 222 South Prospect Avenue, Park Ridge, IL 60068-4001).

- Pass rate for first-time test takers on the National Certification Exam (NCE) offered through the National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA) for the graduating class in 2016 was 80 percent.
- The employment rate for the class that graduated in 2016 was 100 percent within three months of graduation.
- The attrition rate for the class that graduated in 2016 was 4 percent.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in all course work.

Core Courses		
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
Anesthesia Didactic Courses		
NRSG 6320	Role/Practice Issues in Nurse Anesthesia	3

NRSG 6321	Conceptual Basis of Nurse Anesthesia Practice 1	3
NRSG 6322	Conceptual Basis of Nurse Anesthesia Practice 2	3
NRSG 6324	Chemistry and Physics in Anesthesia	3
NRSG 6325	Pharmacotherapeutics in Anesthesia and Critical Care Nursing	2
NRSG 6333	Conceptual Basis of Nurse Anesthesia Practice 3	3
NRSG 6336	Advanced Concepts in Nurse Anesthesia Practice	3
Clinical Courses		
Course Work		
NRSG 5117	Advanced Pharmacology	2
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 6115	Health Assessment	3
Elective		
Complete a minimum of 2 semester hours of elective course work.		2
Nurse Anesthesia Clinical Courses		
NRSG 6530	Nurse Anesthesia Practicum 1	2
NRSG 6534	Nurse Anesthesia Practicum 2	4
NRSG 6535	Nurse Anesthesia Practicum 3	4
NRSG 6540	Advanced Clinical Experiences in Nurse Anesthesia 1	1
NRSG 6541	Advanced Clinical Experiences in Nurse Anesthesia 2	1
NRSG 6542	Advanced Clinical Experiences in Nurse Anesthesia 3	1
Research Core		
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2

Program Credit/GPA Requirements

54 total semester hours required
Minimum 3.000 GPA required

Nursing and Business Administration, MS/MBA

To earn the degree, you must complete 12 courses in nursing and 12 in business administration. The nursing curriculum integrates a two-semester practicum with the theory and knowledge base appropriate to advanced roles of the nurse manager; the business courses cover the full complement of functional courses delivered in four years of part-time study, although you can take up to seven years to complete the program. All courses are offered late in the day or evening at the Boston campus.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Business Administration Requirements

Business Theory Courses		
ACCT 6272	Financial Statement Preparation and Analysis	2.25
ACCT 6273	Identifying Strategic Implications in Accounting Data	2.25
ENTR 6200	Enterprise Growth and Innovation	3
FINA 6200	Value Creation through Financial Decision Making	3
INTB 6200	Managing the Global Enterprise	3
MECN 6200	Global Competition and Market Dominance	3
MGSC 6200	Information Analysis	3
MGSC 6206	Management of Service and Manufacturing Operations	3
MKTG 6200	Creating and Sustaining Customer Markets	3
STRT 6200	Strategic Decision Making in a Changing Environment	3
Electives		
Business Specialization I and Business Specialization II		4

Nursing Requirements

A grade of B or higher is required in all course work.

Professional Core Courses		
NRSG 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
Research Core Courses		
NRSG 7105	Translating Research Evidence into Practice	3
NRSG 7110	Evidence-Based Practice Research Application	2
Administrative Theory Courses		
NRSG 6301	Human Resources and Operations	3
NRSG 6302	Health Policy and Law	3
NRSG 6306	Health Informatics	3
NRSG 6344	Healthcare Quality Improvement	3
NRSG 6444	Healthcare Systems and Quality Patient Care	3
Administrative Practicum Courses		
NRSG 6510	Nursing Leadership Role Practicum 1 (112 Practicum Hours)	3
NRSG 6520	Nursing Leadership Role Practicum 2 (112 Practicum Hours)	3
Total 224 practicum hours		

Program Credit/GPA Requirements

64.5 total semester hours required
Minimum 3.000 GPA required

School of Pharmacy

Website (http://www.northeastern.edu/bouve/pharmacy)

John R. Reynolds, PharmD
Professor and Dean

Pharmaceutical Sciences
140 The Fenway
617.373.3406
617.373.8886 (fax)

pharmscigrad@northeastern.edu

Doctor of Pharmacy (PharmD) Program
140 Fenway
617.373.3380
617.373.7655 (fax)
PharmDadmissions@northeastern.edu

The School of Pharmacy is dedicated to excellence in pharmacy-related education, research, and service, including the provision of patient care. We seek to prepare students with knowledge, skills, and values for careers in pharmacy practice and the pharmaceutical sciences. Our programs promote intellectual growth, professionalism, and lifelong learning. Through the generation and dissemination of new knowledge and through scholarship and community service, the school contributes to improved individual and population health.

Programs

Doctor of Philosophy (PhD)

- Biomedical Sciences (p. 243)
- Medicinal Chemistry (p. 243)
- Pharmaceutical Sciences (p. 244)
- Pharmacology (p. 245)

Doctor of Pharmacy (PharmD)

- Doctor of Pharmacy (p. 245)
- Doctor of Pharmacy—Direct Entry (p. 246)

Master of Science (MS)

- Biomedical Nanotechnology (p. 248)
- Biomedical Sciences (p. 249)
- Medicinal Chemistry (p. 249)
- Pharmaceutical Sciences (p. 250)
- Pharmacology (p. 250)

Dual Degree

- Pharmacy and Public Health, PharmD/MPH (p. 228)

Biomedical Sciences, PhD

The department offers a PhD program in biomedical science. Increasingly, scientific work is becoming interdisciplinary. In response to this trend, we allow the student to focus on more than one area in biomedical science. The concept is appropriate for both those entering as well as those currently employed in the field, including research technicians, clinical laboratory workers, science teachers, and science administrators. For those currently employed, the flexibility of our program can enhance their performance in a present position or open up new employment opportunities.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Dissertation committee
Dissertation proposal
Dissertation defense

Required Course Work

A grade of C– or higher is required in each course.

Required Core		
Complete 13–18 semester hours from the following:		13-18
PHSC 5100	Concepts in Pharmaceutical Science	
PHSC 5300	Pharmaceutical Biochemistry	
or PHSC 7010	Pharmaceutical Sciences Laboratory	
PHSC 5310	Cellular Physiology	
PHSC 6210	Drug Design, Evaluation, and Development	
PHSC 6214	Experimental Design and Biostatistics	
PHSC 6216	Human Physiology and Pathophysiology	
PHSC 6212	Research Skills and Ethics	
or BIOL 6381	Ethics in Biological Research	
Pharmaceutics Core		
PMST 6252	Pharmacokinetics and Drug Metabolism	3
PMST 6250	Advanced Physical Pharmacy	2
PMST 6254	Advanced Drug Delivery System	3
Electives		
Complete 7–12 semester hours in the following subject areas:		7-12
PHSC, PMCL, PMST, BIOL, CHEM, NNMD, BIOT		

Seminar and Colloquium

Seminar		
Complete the following (repeatable) course twice:		2
PHSC 6300	Pharmaceutical Science Seminar	
Colloquium		
PHSC 6810	Pharmaceutical Science Colloquium	1

Research and Dissertation

Qualifying Exam		
PHSC 8940	Doctoral Training and Research	1
Proposal Preparation		
PHSC 9681	Doctoral Proposal	2
Dissertation		
Complete the following (repeatable) course twice:		6
PHSC 9990	Dissertation	

Program Credit/GPA Requirements

45 total semester hours required
Minimum 3.000 GPA required

Medicinal Chemistry, PhD

This specialization offered by the Center for Drug Discovery (CDD) trains students in the design and synthesis of novel biologically active compounds and in the study of their mechanisms of action using biochemical, biophysical, and pharmacological approaches. Specializations are available in synthetic, biochemical/pharmacological, and biophysical medicinal chemistry. These will be targeted to treat drug abuse; addiction; and other indications such as neuropathic pain, obesity, neuropsychiatric disorders (psychoses, ADHD, depression, anxiety, eating disorders); and neurodegenerative disorders.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Dissertation committee
Dissertation proposal
Dissertation defense

Requirements

A grade of C– or higher is required in each course.

Core Courses		
PHSC 5100	Concepts in Pharmaceutical Science	2
PHSC 6210	Drug Design, Evaluation, and Development	2
BIOL 6381	Ethics in Biological Research	2
or PHSC 6212	Research Skills and Ethics	
Chemistry		
CHEM 5612	Principles of Mass Spectrometry	3
CHEM 5626	Organic Synthesis 1	3
CHEM 5628	Principles of Spectroscopy of Organic Compounds	3
CHEM 5672	Organic Synthesis 2	3
CHEM 5676	Bioorganic Chemistry	3
PHSC 6222	The Chemistry and Biology of Drugs of Abuse	2
PHSC 6224	Behavioral Pharmacology and Drug Discovery	2
PHSC 5400	Principles of Drug Design	3
Electives		
Complete 6–7 semester hours in the following subject areas: BIOL, BIOT, CHEM, NNMD, PHSC, PMCL, PMST.		6-7

Seminar and Colloquium

Seminar		
Complete the following (repeatable) course twice:		
PHSC 6300	Pharmaceutical Science Seminar	1
Colloquium		
PHSC 6810	Pharmaceutical Science Colloquium	1

Research and Dissertation

Research		
PHSC 8940	Doctoral Training and Research	1
Proposal Preparation		
PHSC 9681	Doctoral Proposal	2
Dissertation		
Complete the following (repeatable) course twice:		
PHSC 9990	Dissertation	3

Program Credit/GPA Requirements

45 total semester hours required
Minimum 3.000 GPA required

Pharmaceutical Sciences, PhD

Pharmaceutics and Drug Delivery Systems

Students studying pharmaceutics and drug delivery will be thoroughly exposed to the fundamentals of physical pharmacy and pharmaceutics in addition to being trained in several more specialized areas such as:

- Novel drug delivery systems
- Nanomedical technologies
- Physical pharmacy
- Biopharmaceutics and pharmacokinetics

With exposure to these various facets of pharmaceutics, successful graduates are poised to understand and assimilate the field of modern pharmaceutics. A PhD degree in pharmaceutics is a research degree. While course work plays an important role, students become a real participant in the science of pharmaceutics in the laboratory. Faculty research covers a broad range of scientific interests, including pharmacokinetic toxicodynamics of anticancer agents, use of biomaterials and synthetic polymeric systems in design of drug delivery systems, passive and active targeting of therapeutic agents, cardiovascular targeting of drugs, novel delivery systems for proteins and peptides, and mathematical modeling of endogenous compounds.

Interdisciplinary Option

The interdisciplinary option is intended to meet the needs of students interested in combining courses and skills from two areas of specialization. At least one of the specialization areas must come from within the college. The second area may come from a department in another college at Northeastern University, such as biology, chemistry, or engineering. Students electing the interdisciplinary option must fulfill the same requirements as all other PhD candidates.

Program Requirements

Degree Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Dissertation committee
Dissertation proposal
Dissertation defense

Required Course Work

A grade of C– or higher is required in each course.

Required Core		
Complete 13–18 semester hours from the following:		13-18
PHSC 5100	Concepts in Pharmaceutical Science	
PHSC 5310	Cellular Physiology	
PHSC 6210	Drug Design, Evaluation, and Development	
PHSC 6214	Experimental Design and Biostatistics	
PHSC 6216	Human Physiology and Pathophysiology	
PHSC 5300	Pharmaceutical Biochemistry	
or PHSC 7010	Pharmaceutical Sciences Laboratory	
PHSC 6212	Research Skills and Ethics	

or BIOL 6381	Ethics in Biological Research	
Pharmaceutics Core		
PMST 6252	Pharmacokinetics and Drug Metabolism	3
PMST 6250	Advanced Physical Pharmacy	2
PMST 6254	Advanced Drug Delivery System	3
Electives		
Complete 7–12 semester hours from the following subject areas:		7-12
PHSC, PMCL, PMST, BIOL, CHEM, NNMD, BIOT		

Seminar and Colloquium

Seminar		
Complete the following (repeatable) course twice:		2
PHSC 6300	Pharmaceutical Science Seminar	
Colloquium		
PHSC 6810	Pharmaceutical Science Colloquium	1

Research and Dissertation

Qualifying Examination		
PHSC 8940	Doctoral Training and Research	1
Proposal Preparation		
PHSC 9681	Doctoral Proposal	2
Dissertation		
Complete the following (repeatable) course twice:		6
PHSC 9990	Dissertation	

Program Credit/GPA Requirements

45 total semester hours required
Minimum 3.000 GPA required

Pharmacology, PhD

The PhD in pharmacology specialization allows a student to specialize in the study of the actions of drugs. In addition to developing a sound knowledge base through course work and seminars, the program is designed to strengthen the student's ability to comprehend and to evaluate critically the current literature, allowing the conduct of significant independent research. Recent graduates with a PhD in pharmacology have found employment in academic or industrial research positions.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Dissertation committee
Dissertation proposal
Dissertation defense

Pharmacology Requirements

A grade of C– or higher is required in each course.

Required Core		
Complete 13–18 semester hours from the following:		13-18
PHSC 5100	Concepts in Pharmaceutical Science	
PHSC 6210	Drug Design, Evaluation, and Development	
PHSC 6214	Experimental Design and Biostatistics	
PHSC 6216	Human Physiology and Pathophysiology	
PHSC 5300	Pharmaceutical Biochemistry	
or PHSC 7010	Pharmaceutical Sciences Laboratory	
PHSC 5310	Cellular Physiology	
PHSC 6212	Research Skills and Ethics	
or BIOL 6381	Ethics in Biological Research	
Pharmacology		
PMCL 6260	Pharmacology 1	2
PMCL 6261	Pharmacology 2	2
PMCL 6262	Receptor Pharmacology	2
Electives		
Complete 9–14 semester hours from the following subject areas: BIOL, BIOT, CHEM, NNMD, PHSC, PMCL, PMST		9-14

Seminar and Colloquium

Seminar		
Complete the following (repeatable) course twice:		2
PHSC 6300	Pharmaceutical Science Seminar	
Colloquium		
PHSC 6810	Pharmaceutical Science Colloquium	1

Research and Dissertation

Research		
PHSC 8940	Doctoral Training and Research	1
Proposal Preparation		
PHSC 9681	Doctoral Proposal	2
Dissertation		
Complete the following (repeatable) course twice:		6
PHSC 9990	Dissertation	

Program Credit/GPA Requirements

45 total semester hours required
Minimum 3.000 GPA required

Pharmacy, PharmD

Program requirements that follow relate to the final year of the six-year Doctor of Pharmacy (PharmD) program only. For information regarding years one through five of this program, please see the *Undergraduate Catalog* Doctor of Pharmacy (Pharmacy, PharmD) webpage.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

YEAR 1

Summer Term		
Complete 12 semester hours in the following range:		12
PHMD 6440 to PHMD 6474		

YEAR 2

Fall Term		
Complete 12 semester hours in the following range:		12

PHMD 6440 to PHMD 6474	
Spring Term	
Complete 12 semester hours in the following range:	12
PHMD 6440 to PHMD 6474	

Program Credit/GPA Requirements

36 total semester hours required
Minimum 3.000 GPA required

Pharmacy, PharmD—Direct Entry

The School of Pharmacy (SOP) offers the professional Doctor of Pharmacy degree (PharmD). The direct-entry admission pathway for this program requires that students complete a BS or BA from an accredited institution and with a preferred prerequisite grade-point average (GPA) of 3.000. The following prerequisite courses and credits are required:

Requirements	Credits
Chemistry 1 with lab	4
Chemistry 2 with lab	4
General Biology 1 with lab	4
General Biology 2 with lab	4
Calculus	4
Organic Chemistry 1 with lab	4
Organic Chemistry 2 with lab	4
Biochemistry	4
General Psychology	4
English—writing-intensive	4
Human Physiology 1 with lab	4
Human Physiology 2 with lab	4
Physics with lab	4
Arts or humanities electives	4

Direct entry into the first professional year of the PharmD program offers students a four-year graduate course of study that fully integrates campus-based learning with experiential learning, including the university's signature cooperative education (co-op) program, to provide students with the skills and abilities necessary to succeed in the pharmacy profession. Our students promote and ensure the safe and effective use of drugs and provide medication therapy management services. In addition to preparing and dispensing prescribed medications, our students provide information to patients about medications and their uses; advise physicians, other prescribers, and other healthcare practitioners on medication selection, dosages, interactions, and adverse effects; and monitor patient responses to drug therapy.

Our students are well equipped to provide patient care services in a variety of settings. Most of our graduates work in community pharmacies or in healthcare facilities such as hospitals and ambulatory clinics. Additional practice opportunities exist in health maintenance organizations, private practice groups, long-term-care facilities, home healthcare, the Public Health Service, the armed services, and law enforcement agencies such as the Federal Drug Enforcement Administration. Graduates may also find employment in drug development, marketing and research within the pharmaceutical industry, colleges of pharmacy, and professional association management. In addition, many of our graduates go on to pharmacy practice residencies, fellowships, and leading graduate programs.

Doctor of Pharmacy students are admitted with the expectation that by working with faculty, staff, and each other, they will develop the knowledge, skills, and attitudes necessary for academic and professional success. Students follow academic progression plans for their respective years of graduation. Any deviation from the prescribed curriculum will require faculty/staff permission and an approved plan of study from the SOP Academic Standing Committee.

The pharmacy curriculum includes introductory (cooperative education) and advanced pharmacy practice experiences (IPPEs and APPEs). These pharmacy practice experiences are provided primarily under the direct supervision of qualified pharmacist preceptors and occasionally with other qualified healthcare professionals. The school is affiliated with many world-class practice sites throughout the United States, providing students with access to experienced clinicians and scholars. Although every effort is made to accommodate individual circumstances and requests, students should be prepared to travel outside the Boston area to complete some of their pharmacy practice experiences. Availability of a car may be required, as some sites are not accessible by public transportation. All expenses associated with pharmacy practice experiences, including travel and housing, are the responsibility of the student.

IPPEs are competitive placements that are based on job availability in a geographic region. The placements are facilitated by SOP cooperative education coordinators. Students are required to earn a satisfactory (S) grade on one IPPE in a community setting and on one IPPE in an institutional/hospital practice setting.

APPE placements are provided based on site/preceptor availability and the final approval of the SOP Office of Experiential Education (OEE). Students may be able to petition the OEE for out-of-system APPEs; however, availability for such requests is limited.

To be eligible for a PharmD, a student must successfully complete all courses in the curriculum, including the IPPEs (co-op) and APPEs; meet the academic progression standards of the program; meet the technical standards of the program; and satisfy all other requirements as stated in the *Bouvé College of Health Sciences Undergraduate Student Information Manual.* The pharmacy program, which is fully accredited by the Accreditation Council for Pharmacy Education (ACPE) (info@acpe-accredit.org), subscribes to the standards established by ACPE.

Pharmacy graduates must meet specific requirements to qualify for professional licensure in the state where they plan to practice as a registered pharmacist. These requirements include graduating from an accredited school of pharmacy, passing national and state board examinations, and completing internship hours. The internship is a period of practical experience conducted under the supervision of a registered pharmacist. Massachusetts requires 1,500 internship hours, all of which are satisfied through IPPEs (co-op) and APPEs (with total internship hours of up to 1,740).

Professional and/or legal exigencies arise from time to time, which may necessitate changes in a pharmacy course, progression, and/or graduation requirements. Students should review their status with academic advisors on a timely basis and refer to current publications for updated information.

Requirements for APPEs

1. Successful completion of all required and elective didactic course work in the pharmacy curriculum.
2. Successful completion of the APPE preparatory courses Advanced Pharmacy Practice Experience Preparatory Seminar 1 (PHMD 5438)

and Advanced Pharmacy Practice Experience Preparatory Seminar 2 (PHMD 5439).

3. Evidence of health clearance from University Health and Counseling Services before placements at any APPE site.
4. Satisfactory completion of any additional site-specific requirements including, but not limited to, criminal record information (CORI), urine drug screens, and verification of immunization status. All fees associated with these requirements are the responsibility of the student.
5. Adherence to the university's code of conduct policies while off-campus.
6. Successful completion of six, six-week APPEs: four required APPEs (i.e., ambulatory care, community, internal/general medicine, and one health system experience); and two electives that may be patient-care or non-patient-care focused.
7. Maintenance of sufficient knowledge of site-specific requirements (via site descriptions) and completion of site requests within specified deadlines. Failure to complete these requirements as directed will likely result in delay of graduation.
8. Maintenance of an APPE portfolio throughout the APPE year and completion of all portfolio submission requirements within specified deadlines.

Technical Standards

The Doctor of Pharmacy program at Northeastern University is a rigorous and challenging academic program that requires students to possess specific characteristics and abilities within the cognitive, affective, and psychomotor domains, referred to here as technical standards. To successfully progress in and ultimately complete the didactic, laboratory, and experiential components of the Doctor of Pharmacy program, students must meet the standards described below.

INTELLECTUAL ABILITIES

Students must have well-developed problem-solving and critical-thinking skills. Cognitive function must be appropriate to integrate, evaluate, and apply information gained through measurement, analysis, calculation, and reasoning. Students must have the capacity to learn efficiently in classroom, laboratory, small group, and experiential settings and through independent study. Students are required to demonstrate the ability to integrate course content knowledge with clinical practice applications to optimize medication therapy management.

COMMUNICATION SKILLS

Students must be able to communicate effectively with colleagues, professors, patients, families, and healthcare providers. This includes efficiently comprehending, speaking, reading, and writing in English. Students must be able to process and use appropriate nonverbal cues and be proficient in the use of electronic communication media.

BEHAVIORAL AND SOCIAL ATTRIBUTES

Students must demonstrate professionalism, maturity, integrity, honesty, compassion, and respect when relating to others. Students must have sufficient mental and emotional health to complete work and responsibilities using good judgment. Students must be able to tolerate and adapt to stressful workloads and situations and modify behavior based on constructive criticism. Students must be able to function in accordance with the legal, ethical, and professional standards of practice.

OBSERVATION AND MOTOR SKILLS

Students must have functional use of visual, auditory, and tactile senses. Students must be able to observe and perform experiments, physical assessments, patient interviews, and medication order processing. Students must be able to distinguish physical characteristics of medications by inspection. Students must have coordination of gross and fine muscular movements sufficient to perform pharmacy-related tasks including compounding and dispensing medications, administering medications, and using computers and other technology necessary for learning and professional practice.

College Academic Standards—Professional Courses

PharmD students must receive a grade of C or better in professional courses.

- Professional courses are those required courses taught within the major/college as identified by course subject code: PHMD, PHSC.
- Courses in the above-listed subjects that are taken as electives are exempt from the C or better rule, and the university's minimum satisfactory grade will be accepted.
- For PharmD students, failure to earn a satisfactory grade (S) in a co-op will be counted as a professional course failure.

PROGRESSION WITHIN BOUVÉ

The requirements for any graduate degree or certificate of advanced study must yield a cumulative GPA of 3.000 or higher as stated in the university's *Graduate Catalog*.

- To progress into the subsequent year of professional courses, students must have completed all professional prerequisites with the required minimum passing grade.
- To progress into the subsequent semester of professional courses, students must have completed all professional courses with a grade of C or better.
- Students who incur an incomplete grade in a prerequisite course must obtain approval from their academic advisor, upon consultation with the department faculty, prior to progression into the subsequent course(s).

ACADEMIC DISMISSAL FROM MAJOR

PharmD students in the Bouvé College of Health Sciences will be dismissed from their major effective the following academic semester for any of the reasons noted below:

- Failure to earn a grade of C or better in three professional courses, regardless of remediation. Lecture and clinical/lab components for the same class are considered as *one* professional course failure. Within the PharmD program, each specific professional course (with separate registration number) will be counted as a separate failure even if content is related.
- Failure to earn the minimum required grade in the same course twice.
- For PharmD students, the expected graduation date may not be changed more than twice.
- The PharmD program monitors and promotes the development of professional behaviors in its students in order to ensure appropriate professionalism in the classroom, local and global communities, and clinical settings. Breach of adherence to these standards may result in dismissal from the program.

ACADEMIC APPEALS

Students who believe that they were erroneously, capriciously, or otherwise unfairly treated in an academic or cooperative education decision may petition to appeal the decision. Refer to the *Bouvé Graduate Student Policies and Regulations Manual,* which details the Bouvé College of Health Sciences Appeals Process, and the University Graduate Student Academic Appeals Procedures (p. 31).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Program Requirements

YEAR 1

Fall Term		
ENGW 3306	Advanced Writing in the Health Professions	4
PHMD 1201 and PHMD 1202	Introduction to Pharmacy Practice and Lab for PHMD 1201	3
PHSC 3411	Pharmaceutics 1	4
PHSC 4501	Pharmacology/Medicinal Chemistry 1	5
Spring Term		
Advanced Practice Experience		
Summer Term		
PHMD 2310 and PHMD 2311	Educational and Behavioral Interventions in Pharmacy Practice and Lab for PHMD 2310	2.5
PHMD 2350	Healthcare Systems	3
PHSC 3412	Pharmaceutics 2	4
PHSC 3419	Pharmaceutics Laboratory	1
PHSC 4502	Pharmacology/Medicinal Chemistry 2	5

YEAR 2

Fall Term		
Advanced Practice Experience		
Spring Term		
PHMD 3450	Research Methodology and Biostatistics	3
PHMD 4611 and PHMD 4612	Comprehensive Disease Management 1 and Comprehensive Disease Management 1 Seminar	7
PHSC 2330	Immunology	3
PHSC 3430	Pharmacokinetics and Biopharmaceutics	3
Summer Term		
PHMD 4621	Comprehensive Disease Management 2	6
PHMD 4622	Comprehensive Disease Management 2 Seminar	1
PHMD 4623	Comprehensive Disease Management 2 Skills Lab	0.5
PHMD 5223	Evidence-Based Medicine	2
PHMD 5330	Jurisprudence	3
PHSC 5360	Anti-Infectives	4

YEAR 3

Fall Term		
PHMD 4631	Comprehensive Disease Management 3	6
PHMD 4632	Comprehensive Disease Management 3 Seminar	1
PHMD 4633	Comprehensive Disease Management 3 Skills Lab	0.5
PHMD 5250	Pharmacy Care Management	3
PHMD 5438	Advanced Pharmacy Practice Experience Preparatory Seminar 1	0.5
PHSC 4501	Pharmacology/Medicinal Chemistry 1	5
Spring Term		
PHMD 4641	Comprehensive Disease Management 4	6
PHMD 4642	Comprehensive Disease Management 4 Seminar	1
PHMD 4643	Comprehensive Disease Management 4 Skills Lab	0.5
PHMD 5270	Economic Evaluation of Pharmaceuticals and Pharmacy Practice	2
PHMD 5439	Advanced Pharmacy Practice Experience Preparatory Seminar 2	0.5
Summer Term		
Complete 12 semester hours in the following range:		12
PHMD 6440 to PHMD 6474		

YEAR 4

Fall Term		
Complete 12 semester hours in the following range:		12
PHMD 6440 to PHMD 6474		
Spring Term		
Complete 12 semester hours in the following range:		12
PHMD 6440 to PHMD 6474		

Program Credit/GPA Requirements

132 total semester hours required
Minimum 3.000 GPA required

Biomedical Nanotechnology, MS

This Master of Science program in biomedical nanotechnology incorporates aspects of the pharmaceutical sciences curriculum with courses in nanotechnology, entrepreneurship, and law. The combination of these fields results in a unique curriculum that offers students an opportunity to obtain skills not only in the relevant science but also in leadership, business, and intellectual property law. Furthermore, the program directly addresses a core mission of the university: the provision of practice-oriented educational programs in major scientific disciplines.

Program Requirements

Prerequisites: calculus, organic chemistry, biochemistry, and physiology.

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C– or higher is required in each course.

Pharmaceutical		
CHME 5699 or PMST 6252	Special Topics in Chemical Engineering Pharmacokinetics and Drug Metabolism	4
PHSC 5100	Concepts in Pharmaceutical Science	2
PHSC 5300	Pharmaceutical Biochemistry	2
PHSC 5305	Professional Development for Pharmaceutical Sciences	1
PHSC 6212 or BIOL 6381	Research Skills and Ethics Ethics in Biological Research	1
PHSC 6300	Pharmaceutical Science Seminar	1
PHSC 7010	Pharmaceutical Sciences Laboratory	4
PMST 6254	Advanced Drug Delivery System	3

Nanomedicine		
NNMD 5270	Introduction to Nanomedicine Science and Technology	3
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market	3
Business and Enterprise		
ENTR 6200	Enterprise Growth and Innovation	3
ENTR 6212	Business Planning for New Ventures	3
LS 6101	Introduction to Legal Studies 1: Law and Legal Reasoning	3
Research and Internship		
Complete 2 semester hours from the following repeatable courses:		2
PHSC 5976	Directed Study	
PHSC 6401	Pharmaceutical Science Internship	
PHSC 6984	Pharmaceutical Science Research	

Program Credit/GPA Requirements

34 total semester hours required
Minimum 3.000 GPA required

Biomedical Sciences, MS

The department offers MS programs in biomedical science. Increasingly, scientific work is becoming interdisciplinary. In response to this trend, we allow the student to focus on more than one area in biomedical science. The concept is appropriate for both those entering as well as those currently employed in the field, including research technicians, clinical laboratory workers, science teachers, and science administrators. For those currently employed, the flexibility of our program can enhance their performance in a present position or open up new employment opportunities. Graduates of the program will be well prepared to enter related PhD programs at the university.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C– or higher is required in each course.

Required Core		
Complete 13–18 semester hours from the following:		13-18
PHSC 5100	Concepts in Pharmaceutical Science	
PHSC 5300	Pharmaceutical Biochemistry	
or PHSC 7010	Pharmaceutical Sciences Laboratory	
PHSC 5310	Cellular Physiology	
PHSC 6210	Drug Design, Evaluation, and Development	
PHSC 6214	Experimental Design and Biostatistics	
PHSC 6216	Human Physiology and Pathophysiology	
PHSC 6212	Research Skills and Ethics	
or BIOL 6381	Ethics in Biological Research	
Pharmaceutics Core		
PMST 6252	Pharmacokinetics and Drug Metabolism	3
PMST 6250	Advanced Physical Pharmacy	2
PMST 6254	Advanced Drug Delivery System	3
Electives		
Complete 7–12 semester hours in the following subject areas:		7-12
PHSC, PMCL, PMST, BIOL, CHEM, NNMD, BIOT		

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Medicinal Chemistry, MS

This Master of Science program integrates aspects of contemporary medicinal chemistry and pharmacology, emphasizing topics most relevant to therapeutics design, discovery, and action. The core curriculum is an interdisciplinary combination of synthetic organic chemistry, bioorganic chemistry, analytical chemistry, and pharmaceutical sciences courses. In-depth electives are available in these areas. The program offers students the opportunity to develop knowledge of medicinal chemistry that can be applied to a practice-oriented career in the pharmaceutical industry.

Undergraduate prerequisites are general chemistry, organic chemistry, biochemistry, or cell/molecular biology.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C– or higher is required in each course.

Core Courses		
PHSC 5100	Concepts in Pharmaceutical Science	2
PHSC 6210	Drug Design, Evaluation, and Development	2
BIOL 6381	Ethics in Biological Research	2
or PHSC 6212	Research Skills and Ethics	
Chemistry		
CHEM 5612	Principles of Mass Spectrometry	3
CHEM 5626	Organic Synthesis 1	3
CHEM 5628	Principles of Spectroscopy of Organic Compounds	3
CHEM 5672	Organic Synthesis 2	3
CHEM 5676	Bioorganic Chemistry	3
PHSC 5400	Principles of Drug Design	3
PHSC 6222	The Chemistry and Biology of Drugs of Abuse	2
PHSC 6224	Behavioral Pharmacology and Drug Discovery	2
Electives		
Complete 6–7 semester hours in the following subject areas:		6-7
BIOL, BIOT, CHEM, NNMD, PHSC, PMCL, PMST		

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Pharmaceutical Sciences, MS

Pharmaceutical science is a problem-solving discipline concerned with the discovery, design, and use of drugs. Pharmaceutical scientists find new targets for drug development; research how drugs work at a molecular level; and determine how drugs' properties, dosages, and delivery systems affect their performance. Northeastern has a well-deserved reputation among students, researchers, and other universities. Our department has five interlinked Centers of Research Excellence that pursue specific areas of pharmaceutical and chemical research: the Center for Drug Discovery, the New England Inflammation and Tissue Protection Institute, the Center for Pharmaceutical Biotechnology and Nanomedicine, the Center for Translational Imaging, and the Environmental Cancer Research Program. Northeastern offers many of its classes in the evening to accommodate the needs of the working community. Many students in the pharmaceutical science MS program complete their degree on a part-time basis. For those interested in discovery, problem solving, and cutting-edge research in one of the world's foremost scientific and medical environments, Northeastern University's School of Pharmacy in the Bouvé College of Health Sciences is the place to study pharmaceutical science.

Pharmaceutical science is inherently interdisciplinary, and this is reflected in the availability of several options at both the MS and PhD levels. The main options are pharmaceutics and drug delivery, pharmacology, and medicinal chemistry. The curriculum for each of these options allows a degree of flexibility in terms of specific courses taken, and the examples below are not absolute but reflect students' most common choices made with the advice of faculty members. Even more flexibility is possible with the Master of Science in Pharmaceutical Sciences (interdisciplinary concentration).

Just as cars are useless without roads, drugs are useless without an effective delivery system. This is especially important in contemporary pharmaceutical research as new chemical entities are either too hydrophobic (e.g., many anticancer drugs) or hydrophilic and highly labile (e.g., nucleic acids). The Bouvé College of Health Sciences' pharmaceutics faculty and students are developing the pathways that bring small-molecule drugs and biological therapies directly to the target cells.

Our comprehensive program in pharmaceutics has specialists in drug development and delivery who use and deliver treatments. Their goal is to better understand how the chemical and physical properties of drugs and their dosage forms affect many approaches to create drug performance in healthy and diseased systems. Graduate students may elect a program concentrating in:

- Novel drug delivery systems
- Biopharmaceutics and pharmacokinetics
- Physical pharmacy and polymeric dosage form development
- Drug metabolism

With a strong focus on nanotechnology-based advanced delivery systems that address contemporary needs, this concentration also gives you the opportunity to study with some of the world's top researchers. Pharmaceutics students have the option of performing industrial internships during the summer in some of the most prestigious pharmaceutical and biotechnology companies in the area.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C– or higher is required in each course.

Required Core		
Complete 13–18 semester hours from the following:		13–18
PHSC 5100	Concepts in Pharmaceutical Science	2
PHSC 6210	Drug Design, Evaluation, and Development	2
PHSC 6214	Experimental Design and Biostatistics	2
PHSC 6216	Human Physiology and Pathophysiology	2
PHSC 6212	Research Skills and Ethics	1
or BIOL 6381	Ethics in Biological Research	
PHSC 5300	Pharmaceutical Biochemistry	2
or PHSC 7010	Pharmaceutical Sciences Laboratory	
PHSC 5310	Cellular Physiology	2
Pharmaceutics Core		
PMST 6252	Pharmacokinetics and Drug Metabolism	3
PMST 6250	Advanced Physical Pharmacy	2
PMST 6254	Advanced Drug Delivery System	3
Electives		
Complete 7–12 semester hours from the following subject areas:		7–12
PHSC, PMCL, PMST, BIOL, CHEM, NNMD, BIOT		

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Pharmacology, MS

Graduate education in pharmacology embodies the principles and mechanisms of drug action on biological systems. Through course work, seminars, and conferences, students gain exposure to both classical and recent approaches that have led to the development of current theories of drug action. Pharmacology should not be confused with pharmacy, which is a professional degree allowing a licensed individual to dispense drugs.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C– or higher is required in each course.

Required Core		
Complete 13–18 semester hours from the following:		13-18
PHSC 5100	Concepts in Pharmaceutical Science	
PHSC 6210	Drug Design, Evaluation, and Development	
PHSC 6214	Experimental Design and Biostatistics	
PHSC 6216	Human Physiology and Pathophysiology	
PHSC 5300	Pharmaceutical Biochemistry	
or PHSC 7010	Pharmaceutical Sciences Laboratory	
PHSC 5310	Cellular Physiology	
PHSC 6212	Research Skills and Ethics	

or BIOL 6381	Ethics in Biological Research	
Pharmacology		
PMCL 6260	Pharmacology 1	2
PMCL 6261	Pharmacology 2	2
PMCL 6262	Receptor Pharmacology	2
Electives		
Complete 9–14 semester hours from the following subject areas:		9-14
BIOL, BIOT, CHEM, NNMD, PHSC, PMCL, PMST		

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Pharmacy and Public Health, PharmD/MPH

The School of Pharmacy and the Department of Health Sciences offer a combined Doctor of Pharmacy (PharmD) and Master in Public Health (MPH) program.

The combined PharmD/MPH program recognizes and reinforces the importance of public health in pharmacy practice. Central to addressing urban public health concerns, and in particular those associated with racial and ethnic health disparities, the program is committed to building a strong, diverse, and activist public health workforce. The goal of the program is to graduate professionals who are well educated in the complex issues associated with disparate health status and healthcare access. The combined PharmD/MPH program allows qualified and interested students an opportunity to achieve their goal of obtaining a more robust understanding of public health through an MPH degree while also completing their PharmD.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

DOCTOR OF PHARMACY REQUIREMENTS

PHMD 1201	Introduction to Pharmacy Practice	2.5
PHMD 1202	Lab for PHMD 1201	0.5
PHMD 2350	Healthcare Systems	3
PHSC 4501	Pharmacology/Medicinal Chemistry 1	5
PHSC 3411	Pharmaceutics 1	4
PHMD 2310	Educational and Behavioral Interventions in Pharmacy Practice	2
PHMD 2311	Lab for PHMD 2310	0.5
PHSC 4502	Pharmacology/Medicinal Chemistry 2	5
PHSC 3412	Pharmaceutics 2	4
PHSC 3419	Pharmaceutics Laboratory	1
PHMD 5250	Pharmacy Care Management	3
PHSC 3430	Pharmacokinetics and Biopharmaceutics	3
PHSC 2330	Immunology	3
PHMD 4611	Comprehensive Disease Management 1	6
PHMD 4612	Comprehensive Disease Management 1 Seminar	1
PHSC 5360	Anti-Infectives	4
PHMD 5330	Jurisprudence	3
PHMD 4621	Comprehensive Disease Management 2	6
PHMD 4622	Comprehensive Disease Management 2 Seminar	1
PHMD 4623	Comprehensive Disease Management 2 Skills Lab	0.5
PHMD 4631	Comprehensive Disease Management 3	6
PHMD 4632	Comprehensive Disease Management 3 Seminar	1
PHMD 4633	Comprehensive Disease Management 3 Skills Lab	0.5
PHMD 5223	Evidence-Based Medicine	2
PHMD 5438	Advanced Pharmacy Practice Experience Preparatory Seminar 1	0.5
PHMD 4641	Comprehensive Disease Management 4	6
PHMD 4642	Comprehensive Disease Management 4 Seminar	1
PHMD 4643	Comprehensive Disease Management 4 Skills Lab	0.5
PHMD 5270	Economic Evaluation of Pharmaceuticals and Pharmacy Practice	2
PHMD 5439	Advanced Pharmacy Practice Experience Preparatory Seminar 2	0.5
PHMD 4641	Comprehensive Disease Management 4	6
PHMD 4642	Comprehensive Disease Management 4 Seminar	1
PHMD 4643	Comprehensive Disease Management 4 Skills Lab	0.5
PHMD 5270	Economic Evaluation of Pharmaceuticals and Pharmacy Practice	2
PHMD 5439	Advanced Pharmacy Practice Experience Preparatory Seminar 2	0.5
Required Practice Experience		
Complete 36 semester hours of required practice experience:		36
PHMD 6440-PHMD 6474		

MASTER OF PUBLIC HEALTH REQUIREMENTS

Core Requirements		
PHTH 5120	Race, Ethnicity, and Health in the United States	3
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
PHTH 5212	Public Health Administration and Policy	3
PHTH 5214	Environmental Health	3
PHTH 5540	Health Education and Program Planning	3
PHTH 6200	Principles and History of Urban Health	3
PHTH 6204	Society, Behavior, and Health	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 6966	Practicum	3
PHTH 6910	Public Health Capstone	3
Electives		
Complete 9 semester hours in the following subject area:		9
PHTH or approved electives in other subject areas		

Program Credit/GPA Requirements

156 total semester hours required
Minimum 3.000 GPA required

Physical Therapy, Movement, and Rehabilitation Sciences

Website (http://www.northeastern.edu/bouve/pt)

Kristin Curry Greenwood, PT, DPT, EdD, MS
Associate Clinical Professor and Interim Chair

Anne Golub Victor, PT DPT, MPH
Clinical Professor and Interim Associate Chair

Sonya Larrieux, PT, MA, PhD, C/NDT
Director, Postbaccalaureate Admissions

Diane Fitzpatrick, PT, DPT, MS, GCS, CEEAA
Associate Director, Postbaccalaureate Admissions

301 Robinson Hall
617.373.3908
617.373.3161 (fax)
physicaltherapy@northeastern.edu

Our programs build on the university's core values of interdisciplinary education, urban engagement, international knowledge, and cutting-edge research. Our exceptional faculty are dedicated to promoting excellence in practice, education, scholarship, and community service. Faculty are engaged in active clinical research and practice. A hallmark of our program is the integration of experiential learning and didactic education whether through use of standardized patients, communication and interaction with community consultants, participation in service-learning, or engagement in research with our faculty.

The Department of Physical Therapy, Movement, and Rehabilitation Sciences graduates are innovative, global leaders who excel in clinical practice, research, worker wellness, ergonomics, disability studies, and community service. With one of the longest accredited physical therapy programs in the United States, and the only program with cooperative education, Northeastern University seeks to graduate students with exceptional clinical decision-making skills and experience in the field of physical therapy. Our Master in Occupational Ergonomics and Health program, open to individuals with various backgrounds, is a unique program combining health promotion and disease prevention. We also offer Certificates of Graduate Studies in the areas of disability studies and ergonomics for both licensed physical therapists and for those with nonclinical backgrounds. The Sports Physical Therapy Clinical Residency program is for licensed practicing physical therapists. Our degree programs incorporate cooperative education, a hallmark of Northeastern University.

Unique Program Features

INTERPROFESSIONAL OPPORTUNITIES

The Bouvé van provides community access to healthcare offered in conjunction with the nursing, pharmacy, speech-language pathology, and public health programs. The Arnold S. Goldstein Laboratory Suite is the keystone of our interprofessional simulation-learning program. Simulations are uniquely designed to engage Bouvé students from more than eight different health professions to learn about, from, and with each other to improve health outcomes. Labs can be set up as a variety of practice environments, including hospital rooms, operating rooms, exam rooms, office space, conference rooms, home care settings, or even a dorm room.

GLOBAL

Beyond the traditional semester abroad, we offer multiple global academic and service-oriented experiences such as international cooperative education and clinical experience, PT academic exchange programs, and global service PT projects to Mexico and Ecuador.

RESEARCH OPPORTUNITIES

The Department of Physical Therapy, Movement, and Rehabilitation Sciences' research mission is to build the evidence for best practices to maintain and improve the health and well-being of the local, national, and global community members. Students have the opportunity to work with faculty to conduct ongoing research in one of the 11 Department of Physical Therapy, Movement, and Rehabilitation Science's labs and centers; including:

- Neuromotor Systems Laboratory
- Laboratory for Locomotion Research
- The ReGameVR Laboratory
- Movement Neuroscience Laboratory
- Rehabilitation and Epidemiology Trainee Program
- Occupational Biomechanics and Ergonomics Laboratory
- Neurophysiology Laboratory
- Teaching and Learning Innovation Laboratory
- Musculoskeletal Epidemiology and Biomechanics Laboratory
- Cadaver Lab
- Neuroscience Wet Lab

Programs

Doctor of Physical Therapy (DPT)

- Physical Therapy (p. 252)
- Physical Therapy—Postbaccalaureate Entry (p. 253)
- Transitional Doctor of Physical Therapy (p. 285)

Master of Science (MS)

- Occupational Ergonomics and Health (p. 254)

Graduate Certificate

- Advanced Study in Orthopedics (p. 323)
- Disability Studies (p. 255)
- Early Intervention (p. 223)
- Occupational Ergonomics and Health (p. 256)

Physical Therapy, DPT

Students who complete their bachelor's degree in rehabilitation sciences at Northeastern automatically matriculate into the final graduate year (year 6) of the Doctorate of Physical Therapy curriculum. Please refer to the undergraduate Physical Therapy program (http://catalog.northeastern.edu/undergraduate/health-sciences/physical-therapy-movement-rehabilitation/dpt) for a complete description of the curriculum and program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C or higher is required in all courses.

Summer Term 1

Complete 6 semester hours from the following:		
PT 6441	Clinical Education 1	6
Summer Term 2		
PT 6215 and PT 6216	Assistive Technology and Lab for PT 6215	4
PT 6250	Clinical Integration 2: Evidence and Practice	2
Complete 2 semester hours from the following range:		2
PT 6231 to PT 6237		
Fall Term		
PT 6251	Diagnostic Imaging	3
PT 6442	Clinical Education 2	6
Spring Term		
PT 6448	Clinical Education 3	9

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Physical Therapy, DPT— Postbaccalaureate Entry

Sonya Larrieux, PT, MA, PhD, C/NDT
Director, Postbaccalaureate Admissions

Diane Fitzpatrick, PT, DPT, MS, GCS, CEEAA
Associate Director, Postbaccalaureate Admissions

301 Robinson Hall
617.373.3908
617.373.3161 (fax)
PB_DPT_INQUIRIES@northeastern.edu

Our Postbaccalaureate Doctor of Physical Therapy (DPT) program (http://www.northeastern.edu/bouve/pt/programs/pbdpt.html)is designed for individuals who hold a minimum of a baccalaureate degree in any major other than physical therapy and have satisfied the prerequisite requirements. Over the course of three and one-half years, this rigorous curriculum provides didactic and experiential learning experiences, the cornerstone of our program. These experiences include cooperative education, simulated patient interactions, engagement with consumer clients, service-learning, clinical research, and clinical education experiences.

Emphasis on Experiential Learning

COOPERATIVE EDUCATION

Our DPT program provides students with six months of full-time experiential learning in addition to the required clinical affiliations necessary for licensure. Through cooperative education, the hallmark of Northeastern University, students are able to integrate semesters of academic study with semesters of cooperative education experiences in hospitals and clinics throughout the country and around the globe. Students may be employed as physical therapy co-ops with increasing responsibilities commensurate with their academic studies or perform other health-related duties.

CLINICAL EDUCATION

The curriculum also includes three rotations for a total of 36 weeks of clinical education under the direct supervision of a licensed physical therapist. We are affiliated with world-class medical centers and clinical sites throughout the United States, providing students with access to master clinicians and clinical scholars. Every effort is made to accommodate individual circumstances, but students should be prepared to travel out of state for two of the three clinical placements. Availability of a car may be required, as most sites are not accessible by public transportation. All expenses associated with clinical education, including travel and housing, are the responsibility of the student.

GLOBAL OUTREACH

Students may participate in short cultural immersion experiences abroad whereby they engage in community service projects under the direction of a physical therapy faculty member or on physical therapy academic exchanges with partner academic institutions.

SERVICE-LEARNING

During the curriculum, students participate in service-learning opportunities in the local community in which they learn and apply skills and knowledge related to program objectives. These opportunities start during the first academic year and continue throughout the program in a variety of settings.

ABILITY TO CONCENTRATE

Once in the program, students may have the ability to acquire additional information in two areas of concentration. The **Certificate in Early Intervention** (p. 223) is an interprofessional program that meets the state and national requirements for personnel to work with families, infants and toddlers with disabilities, or those who are at risk for developmental delays. The **Sports Strength and Conditioning Concentration** seeks to prepare the physical therapy student to confidently pursue a sports physical therapy position working with athletes of all ages in a variety of settings. In both areas, students take additional course work and conduct focused research and clinical rotations that expand upon the entry-level physical therapy curriculum.

STUDENT RESEARCH

Physical therapy students participate in research that is integrated into the curriculum. Students have the opportunity to work with faculty to conduct ongoing research in world-renowned medical centers, in one of the 11 Department of Physical Therapy, Movement, and Rehabilitation Science's labs and centers (e.g., Neuromotor Systems Lab, Lab for Locomotion Research, The ReGameVR Lab, Movement Neuroscience Lab, Rehabilitation and Epidemiology Trainee Program, Occupational Biomechanics and Ergonomics Lab, Neurophysiology Lab, Teaching and Learning Innovation Lab, Musculoskeletal Epidemiology and Biomechanics Lab, Cadaver Lab, and Neuroscience Wet Lab). The successful outcome is the ability to conduct and present quality research at local and/or national-level conferences.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C or higher is required in all courses.

YEAR 1

Spring Term		
HLTH 5450 and HLTH 5451	Healthcare Research and Recitation for HLTH 5450	4
PT 5101 and PT 5102	Foundations of Physical Therapy and Lab for PT 5101	4
PT 5131 and PT 5132	Gross Anatomy and Lab for PT 5131	5
PT 5160 and PT 5161	Psychosocial Aspects of Healthcare and Psychosocial Aspects of Healthcare Seminar	4

Summer Term		
PT 5133 and PT 5134	Kinesiology and Lab for PT 5133	4
PT 5138 and PT 5139	Neuroscience and Lab for PT 5138	5
PT 5140 and PT 5141	Pathology and Recitation for PT 5140	4
PT 5145	Introduction to the Healthcare System	2

YEAR 2

Fall Term		
PT 5111	Professional Development for Bouvé Graduate Co-op	1
PT 5500	Pharmacology for Physical Therapy	4
PT 5150 and PT 5151	Motor Control, Development, and Learning and Lab for PT 5150	5
PT 5503 and PT 5504	Cardiovascular and Pulmonary Management and Lab for PT 5503	5
Spring Term		
PT 6964	Co-op Work Experience	0
Summer Term 1		
PT 6964	Co-op Work Experience	0
Summer Term 2		
PT 5515 and PT 5516	Integumentary Systems and Advanced Modalities and Lab for PT 5515	3
PT 5540	Clinical Integration 1: Evidence and Practice	2
PT 6243 and PT 6244	Health Education, Promotion, and Wellness and Recitation for PT 6243	3

YEAR 3

Fall Term		
PT 5209 and PT 5210	Neurological Rehabilitation 1 and Lab for PT 5209	5
PT 5227	Physical Therapy Project 1	3
PT 5505 and PT 5506	Musculoskeletal Management 1 and Lab for PT 5505	5
PT 6000	Leadership, Administration, and Management	2
PT 6241	Screening for Medical Conditions in Physical Therapy Practice	4
Spring Term		
PT 5226	Physical Therapy Professional Seminar 2	2
PT 5229	Physical Therapy Project 2	2
PT 5230	Pediatric and Geriatric Aspects of Life Span Management	3
PT 6221 and PT 6222	Neurological Rehabilitation 2 and Lab for PT 6221	5
PT 6223 and PT 6224	Musculoskeletal Management 2 and Lab for PT 6223	5
Summer Term 1		
PT 6441	Clinical Education 1	6
Summer Term 2		
PT 6215 and PT 6216	Assistive Technology and Lab for PT 6215	4
PT 6250	Clinical Integration 2: Evidence and Practice	2
Complete 2 semester hours in the following range:		2
PT 6231 to PT 6237		

YEAR 4

Fall Term		
PT 6251	Diagnostic Imaging	3
PT 6442	Clinical Education 2	6
Spring Term		
PT 6448	Clinical Education 3	9

Program Credit/GPA Requirements

123 total semester hours required
Minimum 3.000 GPA required

Occupational Ergonomics and Health, MS

Lauren A. Murphy, PhD
Assistant Clinical Professor and Graduate Program Director

301 Robinson Hall
617.373.4504
617.373.3161 (fax)
ergonomics@northeastern.edu

Occupational ergonomics and health programs are increasingly important due to the large burden of work-related musculoskeletal disorders (MSDs) and the increased incidence of chronic health conditions of the workforce. These initiatives are especially important with the increase in the aging workforce with their higher incidence of chronic health disorders and the increasing young population entering the workforce with preexisting chronic health issues. In the United States alone, the conservative estimates of direct costs for work-related MSDs are in the magnitude of $50 billion per year. Combined with estimates of indirect costs, these estimates reach $200 billion per year.

The focus of the Master of Science in Occupational Ergonomics and Health program is on primary and secondary prevention approaches for work-related MSDs and injuries. Worker health promotion approaches include workstation configuration and design; modifying work tasks; training workers, supervisors, and caregivers; as well as creating ergonomics management systems, organizational policies and practices, work site wellness programs, and Total Worker Health® efforts.

This master of science program will provide interprofessional training that integrates traditional health protection (ergonomics and safety) and health promotion (wellness) to increase the effectiveness of such workplace programs. Graduates from this unique master's degree program in the United States will be well suited for jobs in industry requiring integration of health and safety programs, thereby fulfilling a need to have well-trained professionals in this domain.

Students who complete the program should be able to:

- Describe the scope and types of workplace programs for ergonomics and health
- Compare fundamental ergonomics approaches to the prevention of work-related injuries, MSDs, and disability
- Develop and administer integrative and innovative approaches to workplace health promotion and wellness programs

- Work collaboratively as part of an interprofessional team
- Analyze factors in the work environment that affect safety and pose risks to workers
- Create worker safety and health prevention programs and apply theory and evidence to support the development of workplace safety and wellness programs

Program Description

The master's degree program requires 36 semester hours divided into 32 semester hours for courses and a 4-semester-hour capstone project. The program can be completed within a year for full-time students and within three years for part-time students. The program is offered in a hybrid format utilizing both online/distance classes when available along with on-campus classroom experiences. Some classes will be fully on-site and the rest will be hybrid (some on-site/online) and others fully online to allow schedule flexibility.

Graduate Student Research

Graduate research opportunities are integrated into the curriculum. Students also have the opportunity to work with faculty to conduct ongoing research in world-renowned companies and in one of the twelve Department of Physical Therapy, Movement, and Rehabilitation Science's labs and centers (e.g., Neuromotor Systems Lab, Lab for Locomotion Research, Cancer Survivorship Center, the ReGameVR Lab, Movement Neuroscience Lab, Rehabilitation and Epidemiology Trainee Program, Occupational Biomechanics and Ergonomics Lab, Neurophysiology Lab, Teaching and Learning Innovation Lab, Musculoskeletal Epidemiology and Biomechanics Lab, Cadaver Lab, and Neuroscience Wet Lab).

Progression in the Program

To progress in the program, students must maintain acceptable standards of scholarship and academic performance as stated in the academic requirements section of this catalog. Students must develop professional behaviors and emotional maturity.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Research		
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
Occupational Health		
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management	3
PHTH 5214	Environmental Health	3
PT 5600	Ergonomics and the Work Environment	3
PT 5610	Workplace Wellness and Health Promotion	3
PT 6978	Independent Study	4
Electives		
Complete five of the following:		13-14
CAEP 6203	Understanding Culture and Diversity	
CAEP 6220	Development Across the Life Span	
IE 7315	Human Factors Engineering	
PHTH 5224	Social Epidemiology	
PHTH 5228	Advances in Measuring Behavior	
PHTH 5240	Evaluating Scientific Evidence	
PHTH 6320	Qualitative Methods in Health and Illness	
PT 6243	Health Education, Promotion, and Wellness	
SOCL 7270	Sociology of Work and Employment	

Program Credit/GPA Requirements

36 total semester hours required
Minimum 3.000 GPA required

Disability Studies, Graduate Certificate

People with disabilities constitute the largest minority group living in the United States today. They face the same discrimination, marginalization, and bias that affect individuals from other minority groups. These factors create a social climate where people with disabilities are unable to fully integrate and participate in activities that are important for all individuals and to make contributions to their communities. This occurs because people with disabilities are often disadvantaged in the receipt of education, social services, healthcare, and opportunities for employment.

Disability studies allows for a broad range of disciplines—including the social sciences, education, healthcare, the sciences, law, and public policy—to work together to create equity and social justice for the diverse group of people with disabilities. A key focus of disability studies is to remove barriers to the participation and inclusion of people in society. These goals can be accomplished through research, public policy and educational initiatives, advocacy, and by enhancing the capacity of the medical profession to provide high-quality care.

The purpose of this certificate is to educate an interdisciplinary cohort of professionals to become leaders who are able to work collaboratively to create changes in the social, economic, political, educational, medical, and physical environments. Successful graduates are able to create changes that support people with disabilities to live satisfying lives of inclusion and integration within the community at large.

Program Description

The Graduate Certificate in Disability Studies program (http://www.northeastern.edu/bouve/physical-therapy/programs/disability-studies) requires 16 semester hours of course work. The four required courses are offered exclusively online.

An optional directed study on advocacy is available to students in place of PT 5730, Global Perspectives in Disability and Health. It will occur under the auspices of an agency or organization that is currently filling a need for people with disabilities in the community. This directed study will be developed collaboratively by the student, community agency, and faculty.

Progression in the Program

To progress in the program, students must maintain acceptable standards of scholarship and academic performance as stated in the academic requirements section of this catalog. Students must develop professional behaviors and emotional maturity.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

PT 5710	Psychosocial Aspects of Disability	4

PT 5720	Legal and Policy Issues Surrounding Disability	4
PT 5730	Global Perspectives in Disability and Health	4
HLTH 5280	The (in)Visibility of (dis)Ability in Society	4
or PT 5740	Disabilities Practicum	

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Occupational Ergonomics and Health, Graduate Certificate

The occupational ergonomics and health graduate certificate focuses on approaches that promote worker well-being and prevent work-related musculoskeletal disorders (MSDs) and injuries. What makes this certificate unique is the emphasis on not just physical ergonomic factors, like the design of tools and equipment, but also the importance of organizational ergonomic factors, like policies, communication, and teamwork. This is important because the management of workplace ergonomics and health programs requires a multidisciplinary set of skills based on understanding the interaction of the work environment, including the physical and organizational factors.

The workplace of the 21st century demands an interprofessional approach that reaches across organizational boundaries, making health and safety a uniform and consistent value within the organization to effectively impact worker health. Add to your professional experience by specializing in workplace approaches that integrate health and safety programs.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in each course.

Required Courses		
PT 5600	Ergonomics and the Work Environment	3
PT 5610	Workplace Wellness and Health Promotion	3
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
Elective		
Complete 3 semester hours from the following:		3
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management	
PHTH 5214	Environmental Health	

Program Credit/GPA Requirements

15 total semester hours required
Minimum 3.000 GPA required

Physician Assistant

Website (http://www.northeastern.edu/bouve/pa)

Trenton Honda, PhD, MMS, PA-C
Assistant Clinical Professor and Program Director

202 Robinson Hall
617.373.3195
617.373.3338 (fax)
paprogram@northeastern.edu

Established in 1971, the physician assistant (PA) program has a long-standing history of, and expertise in, the education and training of physician assistants. The PA program is located in close proximity to Boston's major academic medical centers and was the first generalist PA training program in the nation to offer a master's degree in 1985.

This rigorous, highly integrated curriculum offers our students the opportunity to obtain broad generalist training that prepares them for successful employment in all fields of clinical practice. Our instructional faculty members are practicing clinicians from throughout New England, and most have been teaching with the program for many years. The clinical year is designed to provide students with experience in diverse healthcare settings in our well-established network of clinical rotation sites.

Northeastern's PA program graduates are employed in positions across the United States, and some have worked internationally. In addition to clinical practice, our graduates are employed in research, administration, and education.

Programs

Master of Science (MS)

- Physician Assistant Studies (p. 256)

Dual Degree

- Physician Assistant Studies and Health Informatics, MS/MS (p. 257)
- Physician Assistant Studies and Public Health, MS/MPH (p. 229)

Physician Assistant Studies, MS

Physician assistants (PAs) are healthcare providers who practice medicine with physician supervision. They are highly sought after members of the healthcare team who provide diagnostic and therapeutic patient care. The physician assistant studies (MS) program is a full-time, two-year graduate program that provides an opportunity to earn a Master of Science in Physician Assistant Studies.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Didactic Year Required Courses

A grade of C or higher is required in each course.

PA 6200	Anatomy and Physiology 1	3
PA 6201	Anatomy and Physiology 2	3
PA 6203	Physical Diagnosis and Patient Evaluation 1	3
PA 6204	Physical Diagnosis and Patient Evaluation 2	3
PA 6205	Pharmacology 1	2
PA 6206	Pharmacology 2	2
PA 6207	Clinical Laboratory and Diagnostic Methods	4

PA 6208	Professional Issues for Physician Assistants	2
PA 6311	Principles of Medicine 1	4
PA 6312	Principles of Medicine 2	4
PA 6313	Principles of Medicine 3	4
PA 6320	Principles of Obstetrics and Gynecology	2
PA 6321	Principles of Surgery	2
PA 6322	Principles of Orthopedics	2
PA 6323	Clinical Neurology	2
PA 6324	Principles of Pediatrics	2
PA 6325	Principles of Psychiatry	2
PA 6326	Aspects of Primary Care	4
PA 6327	Emergency Medicine and Critical Care	2
PA 6328	Aging and Rehabilitation Medicine	2
PA 6329	Healthcare Delivery	2
PA 6330	Research Design	2

Clinical Year Required Courses

A grade of C or higher is required in each course.

PA 6400	Applied Study in Medicine	5
PA 6401	Applied Study in Ambulatory Medicine	5
PA 6402	Applied Study in Family Practice	5
PA 6403	Applied Study in Emergency Medicine	5
PA 6404	Applied Study in Obstetrics and Gynecology	5
PA 6405	Applied Study in Pediatrics	5
PA 6406	Applied Study in Surgery	5
PA 6407	Applied Study in Mental Health	5
PA 6408	Applied Study Elective	5

Program Credit/GPA Requirements

103 total semester hours required
Minimum 3.000 GPA required

Physician Assistant Studies and Health Informatics, MS/MS

The Northeastern University health informatics and physician assistant combined program allows qualified and interested students to achieve their goal of obtaining a more robust understanding of healthcare technology while also completing robust clinical training in the physician assistant program. This prepares a select group of exceptionally qualified clinicians to become leaders in healthcare technology application and development and fosters interdisciplinary collaboration in order to address problems in the healthcare and health information environments both locally and across the globe. The joint program is designed to provide students a greater understanding of technological issues in clinical practice, quantitative methods, and the use of scientific evidence and cutting-edge technology to optimize clinical workflows and improve patient outcomes.

This dual degree takes 34 months to complete (as opposed to 48, if each degree were pursued separately), and a total number of 8 credits are shared between both degrees.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Physician Assistant Requirements

A grade of C or higher is required in each course.

Didactic Courses		
PA 6200	Anatomy and Physiology 1	3
PA 6201	Anatomy and Physiology 2	3
PA 6203	Physical Diagnosis and Patient Evaluation 1	3
PA 6204	Physical Diagnosis and Patient Evaluation 2	3
PA 6205	Pharmacology 1	2
PA 6206	Pharmacology 2	2
PA 6207	Clinical Laboratory and Diagnostic Methods	4
PA 6208	Professional Issues for Physician Assistants	2
PA 6311	Principles of Medicine 1	4
PA 6312	Principles of Medicine 2	4
PA 6313	Principles of Medicine 3	4
PA 6320	Principles of Obstetrics and Gynecology	2
PA 6321	Principles of Surgery	2
PA 6322	Principles of Orthopedics	2
PA 6323	Clinical Neurology	2
PA 6324	Principles of Pediatrics	2
PA 6325	Principles of Psychiatry	2
PA 6326	Aspects of Primary Care	4
PA 6327	Emergency Medicine and Critical Care	2
PA 6328	Aging and Rehabilitation Medicine	2
PA 6329	Healthcare Delivery	2
Clinical Courses		
PA 6400	Applied Study in Medicine	5
PA 6401	Applied Study in Ambulatory Medicine	5
PA 6402	Applied Study in Family Practice	5
PA 6403	Applied Study in Emergency Medicine	5
PA 6404	Applied Study in Obstetrics and Gynecology	5
PA 6405	Applied Study in Pediatrics	5
PA 6406	Applied Study in Surgery	5
PA 6407	Applied Study in Mental Health	5
PA 6408	Applied Study Elective	5

Health Informatics Requirements

A grade of B– or higher is required in each course.

Core Requirement		
HINF 7701	Health Informatics Capstone Project	3
Business Management Core		
Complete two courses from the following:		6
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management	
HINF 6202	Business of Healthcare Informatics	
HINF 6215	Project Management	
HINF 6240	Improving the Patient Experience through Informatics	
HINF 6335	Management Issues in Healthcare Information Technology	

PHTH 5226	Strategic Management and Leadership in Healthcare	
Health Informatics Core		
Complete two courses from the following:		6
HINF 5102	Data Management in Healthcare	
HINF 5110	Global Health Information Management	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 6205	Creation and Application of Medical Knowledge	
HINF 6350	Public Health Surveillance and Informatics	
HINF 6404	Patient Engagement Informatics and Analytics	
HINF 6405	Quantifying the Value of Informatics	
PHTH 5232	Evaluating Healthcare Quality	
Technical Core		
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
Electives		
Complete two courses from the following:		6
HINF 6325	Legal and Social Issues in Health Informatics	
HINF 6330	Emerging Technologies in Healthcare	
HINF 6345	Design for Usability in Healthcare	
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	

Program Credit/GPA Requirements

128 total semester hours required
Minimum 3.000 GPA required

Physician Assistant Studies and Public Health, MS/MPH

The Northeastern University Physician Assistant (PA) program and Department of Health Sciences offer a combined Master of Science in Physician Assistant Studies (MS)/Master in Public Health Program (MPH) program. The combined PA/MPH program allows qualified and interested students an opportunity to achieve their goal of obtaining a more robust understanding of public health through an MPH degree while also completing their Master of Science in Physician Assistant Studies.

Since its inception in 2008, the Northeastern MPH program has distinguished itself from other MPH programs in the area through its unique focus on urban public health. The program's overarching goal is to address urban public health concerns, particularly those associated with racial and ethnic health disparities, in order to build a diverse and activist-oriented public health workforce. The MPH program has a strong commitment to providing a flexible course of study for working professionals. This flexibility allows for easy incorporation into a dual-degree program.

The combined degree that incorporates both programs is designed to help diversify the public health workforce and improve graduates' ability to approach clinical situations with cultural sensitivity and awareness. Successful graduates of the program benefit from having a greater understanding of public health issues in clinical practice, including the racial and ethnic health disparities prevalent in the U.S. healthcare system, as well as a strong grounding in epidemiology, quantitative and qualitative research methods, and the use of scientific evidence, skills critical to many fields of healthcare practice.

This dual degree takes a total of three years to complete (as opposed to four, if each degree were pursued separately), and a total number of 12 credits would be shared between both degrees.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Physician Assistant Requirements

A grade of C or higher is required in each course.

Didactic Courses		
PA 6200	Anatomy and Physiology 1	3
PA 6201	Anatomy and Physiology 2	3
PA 6203	Physical Diagnosis and Patient Evaluation 1	3
PA 6204	Physical Diagnosis and Patient Evaluation 2	3
PA 6205	Pharmacology 1	2
PA 6206	Pharmacology 2	2
PA 6207	Clinical Laboratory and Diagnostic Methods	4
PA 6208	Professional Issues for Physician Assistants	2
PA 6311	Principles of Medicine 1	4
PA 6312	Principles of Medicine 2	4
PA 6313	Principles of Medicine 3	4
PA 6320	Principles of Obstetrics and Gynecology	2
PA 6321	Principles of Surgery	2
PA 6322	Principles of Orthopedics	2
PA 6323	Clinical Neurology	2
PA 6324	Principles of Pediatrics	2
PA 6325	Principles of Psychiatry	2
PA 6326	Aspects of Primary Care	4
PA 6327	Emergency Medicine and Critical Care	2
PA 6328	Aging and Rehabilitation Medicine	2
Clinical Courses		
PA 6400	Applied Study in Medicine	5
PA 6401	Applied Study in Ambulatory Medicine	5
PA 6402	Applied Study in Family Practice	5
PA 6403	Applied Study in Emergency Medicine	5
PA 6404	Applied Study in Obstetrics and Gynecology	5
PA 6405	Applied Study in Pediatrics	5
PA 6406	Applied Study in Surgery	5
PA 6407	Applied Study in Mental Health	5

Master's of Public Health Requirements

A grade of B– or higher is required in each course.

PHTH 5120	Race, Ethnicity, and Health in the United States	3
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
PHTH 5212	Public Health Administration and Policy	3
PHTH 5214	Environmental Health	3
PHTH 5232	Evaluating Healthcare Quality	3
PHTH 5540	Health Education and Program Planning	3
PHTH 6200	Principles and History of Urban Health	3
PHTH 6204	Society, Behavior, and Health	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 6966	Practicum	3
PHTH 6910	Public Health Capstone	3
Electives		
Complete 3 semester hours of approved elective course work.		3

Program Credit/GPA Requirements

133 total semester hours required
Minimum 3.000 GPA required

Interdisciplinary

Website (http://www.northeastern.edu/bouve/interdisciplinary)

Daniel A. Feinberg, MBA
Assistant Clinical Instructor and Program Director, Health Informatics Program

Health Informatics Program
312 Robinson Hall
617.373.5005 (fax)
Daniel A. Feinberg, Assistant Clinical Instructor and Program Director, d.feinberg@northeastern.edu

Stephen Intille, PhD
Associate Professor and Program Director, Personal Health Informatics Program

Personal Health Informatics Program
974 West Village H
617.373.3711
Stephen Intille, Associate Professor and Program Director, s.intille@northeastern.edu

With Northeastern University's interdisciplinary graduate programs in health informatics, you have an opportunity to gain the knowledge and skills needed to use information technology to improve healthcare delivery and outcomes—and to advance your career in a growing field. We seek to educate the leaders who use technology to improve healthcare for the future.

Programs

Doctor of Philosophy (PhD)

- Personal Health Informatics (p. 259)

Master of Science (MS)

- Biotechnology (p. 259)
- Health Data Analytics (p. 98)
- Health Informatics (p. 98)
- Health Informatics—ALIGN (p. 99)

Dual Degree

- Physician Assistant Studies and Health Informatics, MS/MS (p. 257)

Graduate Certificate

- Aging (p. 266)
- Biopharmaceutical Analytical Sciences (p. 266)
- Early Intervention (p. 223)
- Health Informatics Management and Exchange (p. 267)
- Health Informatics Privacy and Security (p. 267)
- Health Informatics Software Engineering (p. 267)

Personal Health Informatics, PhD

Northeastern University's interdisciplinary doctoral program in personal health informatics seeks to prepare researchers to design and evaluate technologies that improve health and wellness with the potential to transform healthcare. The joint degree program combines a strong curriculum in human-computer interface technology and experimental design in health sciences. Read additional information (p. 96).

Biotechnology, MS

Overview

The Master of Science in Biotechnology is a Professional Master of Science (PSM) degree, an innovative graduate degree designed to allow students to pursue advanced training and excel in science while simultaneously developing highly valued business skills without acquiring a PhD or MBA. PSM programs are characterized by instruction in advanced science or mathematics, business courses, and a graduate co-op providing a real-world work experience. Graduates are referred to as "T-shaped" professionals with both deep knowledge of a specific discipline and broad knowledge of the communications and relational skills necessary to excel in any business and adapt to a changing workplace. The PSM is a nonthesis degree.

Molecular Biotechnology Concentration

The molecular biotechnology concentration provides students with didactic and practical knowledge in molecular biotechnology, protein expression, and structural biology. Students learn how to generate and optimize molecular forms used to express recombinant proteins to be used as biopharmaceuticals. Particular attention is paid to cutting-edge technologies such as RNAi and CRISPR/CAS9. In addition, the students learn how to purify biopharmaceuticals and analyze aggregation and how to prevent it.

Process Sciences Concentration

The process sciences concentration focuses on the production of drug substance of biopharmaceuticals from cell culture process to purification of the biologic molecules. The students learn the principles of development and implementation of biological manufacturing processes through the integration of concepts and fundamentals of engineering and life sciences. The concentration addresses biochemical engineering, mammalian cell culture process development, and protein purification. The learning of the students is reinforced by both lecture courses and project-driven laboratory experience that provides hands-on learning of cell culture and protein separation.

Biopharmaceutical Analytical Sciences Concentration

The biopharmaceutical analytical sciences concentration focuses on structures and activities of biological molecules and their variants formed during the production of biopharmaceuticals. Students learn the diversity of molecular forms derived from the biological products through various biological and chemical mechanisms and the impact of these structural changes on the safety and efficacy of these biopharmaceuticals. The students learn the science and practice applied in the biotechnology industry to analyze and characterize these molecular forms. This is accomplished through both lecture courses of the analytical sciences and project-driven laboratory experience that utilizes analytical techniques such as mass spectrometry and molecular separations.

Pharmaceutical Technologies Concentration

The pharmaceutical technologies concentration focuses on the conversion of purified proteins to biopharmaceutical drug products that are compatible for clinical use. This concentration addresses the design of the product formulation and the development and implementation of the drug product manufacturing processes. Students learn the sciences of the interactions of the biologic molecules in the process conditions and the relevant process technology, such as aseptic operations and freeze-drying, needed for drug product manufacturing. This is accomplished through both lecture courses and project-driven laboratory experience that offers hands-on learning of formulation design and drug product process development.

Biotechnology Enterprise Concentration

The biotechnology enterprise concentration integrates business and management skills with the science of biotechnology. Students learn the fundamental concepts of leadership, entrepreneurship and innovation, financial decision making, and marketing. They gain teamwork, management, and business development skills in the process and graduate prepared to become scientist-managers.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

General Core		
BIOT 5120	Introduction to Biotechnology	3
BIOT 5219	The Biotechnology Enterprise	2
BIOT 5631	Cell Culture Processes for Biopharmaceutical Production	3
BIOL 6299	Molecular Cell Biology for Biotechnology	3
CHEM 5620	Protein Chemistry	3
CHEM 7317	Analytical Biotechnology	3
PHSC 6214	Experimental Design and Biostatistics	2
Co-op		
BIOT 6500	Professional Development for Co-op	0
BIOT 6964	Co-op Work Experience	0

Concentrations

Complete one of the following five concentrations:

- Biopharmaceutical Analytical Sciences Concentration (p. 260)
- Biotechnology Enterprise Concentration (p. 260)
- Molecular Biotechnology Concentration (p. 260)
- Pharmaceutical Technologies Concentration (p.)
- Process Sciences Concentration (p.)

BIOPHARMACEUTICAL ANALYTICAL SCIENCES CONCENTRATION

BIOT 5145	Basic Biotechnology Lab Skills	1
BIOT 7245	Biotechnology Applications Laboratory	3
CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis	3
CHEM 5616	Protein Mass Spectrometry	3
Electives (p. 260)		5

BIOTECHNOLOGY ENTERPRISE CONCENTRATION

BIOT 5225	Managing and Leading a Biotechnology Company	3
BIOT 5226	Biotechnology Entrepreneurship	3
BIOT 5227	Economics and Marketing for Biotechnology Managers	3
Electives (p. 260)		6

MOLECULAR BIOTECHNOLOGY CONCENTRATION

BIOT 5145	Basic Biotechnology Lab Skills	1
BIOT 5810	Cutting-Edge Applications in Molecular Biotechnology	3
BIOT 5850	Higher-Order Structure Analytics	3
BIOT 7245	Biotechnology Applications Laboratory	3
Electives (p. 260)		5

PHARMACEUTICAL TECHNOLOGIES CONCENTRATION

BIOT 5145	Basic Biotechnology Lab Skills	1
BIOT 5640	Drug Product Processes for Biopharmaceuticals	3
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations	3
BIOT 7245	Biotechnology Applications Laboratory	3
Electives (p. 260)		5

PROCESS SCIENCES CONCENTRATION

BIOT 5145	Basic Biotechnology Lab Skills	1
BIOT 5560	Bioprocess Fundamentals	3
BIOT 5635	Downstream Processes for Biopharmaceutical Production	3
BIOT 7245	Biotechnology Applications Laboratory	3
Electives (p. 260)		5

Elective List

Electives not on this list may be chosen with faculty advisor approval.

BINF 6308	Bioinformatics Computational Methods 1
BIOL 5100	Biology Colloquium
BIOL 5307	Biological Electron Microscopy
BIOL 5499	Plant Biotechnology
BIOL 5543	Stem Cells and Regeneration
BIOL 5549	Microbial Biotechnology
BIOL 5569	Advanced Microbiology
BIOL 5573	Medical Microbiology
BIOL 5581	Biological Imaging
BIOL 5583	Immunology
BIOL 6381	Ethics in Biological Research

BIOL 6399	Dynamics of Microbial Ecology
BIOL 7303	Structural Biology
BIOL 7382	Research Problem Solving
BIOL 7383	Topics in Biochemistry Cell and Molecular Biology
BIOL 7384	Topics in Integrative Biology
BIOT 5220	The Role of Patents in the Biotechnology Industry, Past and Future
BIOT 5225	Managing and Leading a Biotechnology Company
BIOT 5226	Biotechnology Entrepreneurship
BIOT 5227	Economics and Marketing for Biotechnology Managers
BIOT 5330	Drug Safety and Immunogenicity
BIOT 5560	Bioprocess Fundamentals
BIOT 5635	Downstream Processes for Biopharmaceutical Production
BIOT 5640	Drug Product Processes for Biopharmaceuticals
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations
BIOT 7300	Special Topics in Biotechnology
BIOT 7303	Special Topics in Biopharmaceutical Regulatory Science
CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis
CHEM 5616	Protein Mass Spectrometry
CHEM 5617	Protein Mass Spectrometry Laboratory
CHEM 5621	Principles of Chemical Biology for Chemists
CHEM 5625	Chemistry and Design of Protein Pharmaceuticals
CHEM 5638	Molecular Modeling
CHEM 5639	Chemical Kinetics
CHEM 5644	Principles and Analysis of Carbohydrates
CHEM 5646	Synthesis and Reactivity of Inorganic Compounds
CHEM 5687	Principles of Solid State Chemistry
CHEM 7247	Advances in Nanomaterials
CHME 5260	Special Topics in Chemical Engineering
CHME 7340	Chemical Engineering Kinetics
ENTR 6200	Enterprise Growth and Innovation
ENTR 6210	Managing Operations in Early Stage Ventures
ENTR 6211	Entrepreneurship: Services and Retail Business Creation
ENTR 6212	Business Planning for New Ventures
HINF 5105	The American Healthcare System
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management
MGMT 6210	Law for Managers and Entrepreneurs
MGSC 6200	Information Analysis
NNMD 5270	Introduction to Nanomedicine Science and Technology
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market
NRSG 6800	Introduction to Industry Research Guidelines
PHSC 6212	Research Skills and Ethics
PHSC 6218	Biomedical Chemical Analysis
PHSC 6222	The Chemistry and Biology of Drugs of Abuse
PHSC 6224	Behavioral Pharmacology and Drug Discovery
PHSC 6226	Imaging in Medicine and Drug Discovery
PHSC 6290	Biophysical Methods in Drug Discovery
PHSC 7010	Pharmaceutical Sciences Laboratory
TECE 6260	Measuring and Managing the Cost of Production and Growth
TECE 6230	Entrepreneurial Marketing and Selling
TECE 6250	Lean Design and Development
TOXC 5578	Biochemical Toxicology Lab

Program Credit/GPA Requirements

34 total semester hours required
Minimum 3.000 GPA required

Health Data Analytics, MS

The digitization of healthcare systems in clinical settings, in combination with the explosion of personal data collection devices, provides the opportunity of using data for revolutionizing approaches to care at all levels with an emphasis on precision medicine and person-centered care. The ability to take advantage of this “Big Data” opportunity, however, requires expertise at the intersection of health informatics, data science, and computational modeling. The Master of Science in Health Data Analytics is designed to prepare students to succeed in this emerging field. This program offers a strong, competency-based curriculum that addresses data analytics ranging from data acquisition from traditional and emerging data streams, data aggregation methods, data mining algorithms, predictive computational modeling, and visualization techniques. Students can expect to amass a broad and deep understanding of the various methods, software tools, and topical expertise needed to discover meaningful patterns in health-related data and effectively communicate their implications to a number of diverse stakeholders. Successful graduates of the Master of Science in Health Data Analytics will be effective practitioners and leaders in the rapidly developing domain of data analytics with a focus on health and healthcare.

The interdisciplinary Master of Science in Health Data Analytics consists of 12 courses, drawn from the College of Computer and Information Science and the Bouvé College of Health Science; a capstone project; and an ongoing series of seminars on topics in health data analytics. Two tracks will be available to matriculating students: standard and research based.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Analytics/Modeling/Statistics		
DA 5020	Collecting, Storing, and Retrieving Data	4
DA 5030	Introduction to Data Mining/Machine Learning	4
HINF 6400	Introduction to Health Data Analytics	3
PPUA 5301	Introduction to Computational Statistics	4
PPUA 5302	Information Design and Visual Analytics	4
Healthcare		
HINF 5102	Data Management in Healthcare	3
HINF 5105	The American Healthcare System	3
HINF 5XXX Predictive Analytics and Modeling [1]		3
Thesis/Capstone		
Complete either Thesis or Capstone:		3
Thesis		
HINF XXXX Health Data Analytics Thesis [1]		
Capstone		
HINF 7701	Health Informatics Capstone Project	

[1] Please see college administrator for course information.

Electives

At least one course must be chosen from the methods list.

Methods		
Complete 3–6 semester hours from the following:		3-6
PHTH 5240	Evaluating Scientific Evidence	
PHTH 6202	Intermediate Epidemiology	
PHTH 6210	Applied Regression Analysis	
PHTH 6440	Advanced Methods in Biostatistics	
CS 6350	Empirical Research Methods	
CAEP 7712	Intermediate Statistical Data Analysis Techniques	
CAEP 7716	Advanced Research and Data Analyses 2	
Other Electives		
Complete 0–4 semester hours from the following:		0-4
ARTG 5330	Visualization Technologies	
ARTG 6320	Design of Information-Rich Environments	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 5300	Personal Health Interface Design and Development	
HINF 6215	Project Management	
HINF 6220	Database Design, Access, Modeling, and Security	
PHTH 5226	Strategic Management and Leadership in Healthcare	
PHTH 5232	Evaluating Healthcare Quality	
PHTH 5234	Economic Perspectives on Health Policy	

Program Credit/GPA Requirements

37 total semester hours required

Minimum 3.000 GPA required

Health Informatics, MS

Northeastern's interdisciplinary Master of Science in Health Informatics was the first MS in the field. The program seeks to prepare students to address the combined clinical, technical, and business needs of health-related professionals. Successful students graduate with the knowledge of how technology, people, health, and the healthcare system interrelate; the ability to use technology and information management to improve healthcare delivery and outcomes; and the skills to communicate effectively among healthcare practitioners, administrators, and information technology professionals.

With approval from the health informatics program director, selected students can substitute one course from the Graduate Certificate in Data Analytics for a technical core requirement in the MS in Health Informatics degree, and up to two more courses from the Graduate Certificate in Data Analytics can be counted as electives for the MS in Health Informatics degree.

Northeastern also offers graduate certificate programs in health informatics. Three certificate programs enable you to choose the one that addresses your specific goals. These programs are listed separately in this catalog:

- Graduate Certificate in Health Informatics Management and Exchange
- Graduate Certificate in Health Informatics Privacy and Security
- Graduate Certificate in Health Informatics Software Engineering

Courses in the certificate program also apply toward master's degree requirements. This gives you the flexibility to complete a certificate and be well on your way to earning a degree if you decide later to continue your education.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in each course.

Core Requirements		
HINF 5101	Introduction to Health Informatics and Health Information Systems	3
HINF 5105	The American Healthcare System	3
HINF 7701	Health Informatics Capstone Project	3
Business Management Core		
Complete two courses from the following:		6
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management	
HINF 6202	Business of Healthcare Informatics	
HINF 6215	Project Management	
HINF 6335	Management Issues in Healthcare Information Technology	
HINF 6240	Improving the Patient Experience through Informatics	
PHTH 5226	Strategic Management and Leadership in Healthcare	

Health Informatics Core		
Complete two courses from the following:		6
HINF 5102	Data Management in Healthcare	
HINF 5110	Global Health Information Management	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 6205	Creation and Application of Medical Knowledge	
HINF 6350	Public Health Surveillance and Informatics	
HINF 6404	Patient Engagement Informatics and Analytics	
HINF 6405	Quantifying the Value of Informatics	
PHTH 5232	Evaluating Healthcare Quality	
Technical Core		
Complete two courses from the following:		6
HINF 6220	Database Design, Access, Modeling, and Security	
HINF 6230	Strategic Topics in Programming For Health Professionals	
HINF 6355	Key Standards in Health Informatics Systems	
PHTH 5210	Biostatistics in Public Health	
PHTH 5202	Introduction to Epidemiology	
One course from the following may count toward the technical core requirement:		
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	
Electives		
Complete two courses from the following. Any course not taken to complete a core requirement may be taken as an elective.		6
HINF 6325	Legal and Social Issues in Health Informatics	
HINF 6330	Emerging Technologies in Healthcare	
HINF 6345	Design for Usability in Healthcare	
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	

Program Credit/GPA Requirements

Minimum 33 total semester hours required
Minimum 3.000 GPA required

Health Informatics, MS—ALIGN Program

Our Master of Science in Health Informatics ALIGN program seeks to prepare students from diverse backgrounds to excel in the health informatics field. ALIGN's custom master's degree curricula are tailored to each student's professional and educational background, allowing successful students to transition into careers in high-demand industries. Learn more at the ALIGN webpage (http://www.northeastern.edu/align).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in each course.

ALIGN Course Work		
Complete one or two courses from the following as assigned during admission:		3-6
HINF 0200	Health and Medicine for Nonclinicians	
HINF 6230	Strategic Topics in Programming For Health Professionals	
Core Requirements		
HINF 5101	Introduction to Health Informatics and Health Information Systems	3
HINF 5105	The American Healthcare System	3
HINF 7701	Health Informatics Capstone Project	3
Business Management Core		
Complete two courses from the following:		6
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management	
HINF 6202	Business of Healthcare Informatics	
HINF 6215	Project Management	
HINF 6335	Management Issues in Healthcare Information Technology	
HINF 6240	Improving the Patient Experience through Informatics	
PHTH 5226	Strategic Management and Leadership in Healthcare	
Health Informatics Core		
Complete two courses from the following:		6
HINF 5102	Data Management in Healthcare	
HINF 5110	Global Health Information Management	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 6205	Creation and Application of Medical Knowledge	
HINF 6350	Public Health Surveillance and Informatics	
HINF 6404	Patient Engagement Informatics and Analytics	
HINF 6405	Quantifying the Value of Informatics	
PHTH 5232	Evaluating Healthcare Quality	
Technical Core		
Complete two courses from the following:		6
HINF 6220	Database Design, Access, Modeling, and Security	
HINF 6230	Strategic Topics in Programming For Health Professionals	
HINF 6355	Key Standards in Health Informatics Systems	
PHTH 5210	Biostatistics in Public Health	

PHTH 5202	Introduction to Epidemiology	
One course from the following may count toward the technical core requirement:		
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	
Electives		
Complete two courses from the following. Any course not taken to complete a core requirement may be taken as an elective.		6
HINF 6325	Legal and Social Issues in Health Informatics	
HINF 6330	Emerging Technologies in Healthcare	
HINF 6345	Design for Usability in Healthcare	
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	

Program Credit/GPA Requirements

39 total semester hours required
Minimum 3.000 GPA required

Law and Urban Public Health, JD/MPH

Northeastern University's School of Law and Bouvé College of Health Sciences offer a dual-degree JD/MPH in urban health. Given the worldwide trend toward urbanization, the Master of Public Health (MPH) in Urban Public Health recognizes the growing need for professionals trained to respond to unique public health challenges and opportunities facing urban populations. The MPH program brings together interdisciplinary faculty (from the School of Law, D'Amore-McKim School of Business, College of Social Sciences and Humanities, College of Computer and Information Science, and the Bouvé College of Health Sciences) with expertise in collaborating with diverse urban populations to offer students an opportunity to obtain practice-based knowledge, skills, and experience needed to address urban public health problems.

See JD/MPH program page (http://www.northeastern.edu/law/academics/jd/dual-degrees/jdmph-bouve.html) for more information.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in each required course.

Required Courses		
PHTH 5120	Race, Ethnicity, and Health in the United States	3
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
PHTH 5212	Public Health Administration and Policy	3
PHTH 5214	Environmental Health	3
PHTH 5540	Health Education and Program Planning	3
PHTH 6200	Principles and History of Urban Health	3
PHTH 6204	Society, Behavior, and Health	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 6966	Practicum	3
Capstone		
PHTH 6910	Public Health Capstone	3
Electives		
Complete 9 semester hours from the following. In consultation with your faculty advisor, you may complete electives from another discipline:		9
LAW 7300	Administrative Law	
LAW 7329	Environmental Law	
LAW 7335	Health Law	
LAW 7350	Negotiation	
LAW 7351	Prisoners' Rights Clinic	
LAW 7362	Poverty Law and Practice Clinic	
LAW 7410	Domestic Violence Clinic	
LAW 7422	Human Rights Seminar: Race, Gender, and Culture	
LAW 7428	State Local Government	
LAW 7463	Non-Profit Organizations	
LAW 7469	Disability Law	
LAW 7491	International Human Rights and the Global Economy	
LAW 7494	Bioethics and the Law	
LAW 7512	Problems in Public Health Law	
LAW 7514	Natural Resources Law	
LAW 7518	Affordable Housing Law—Theory and Practice	
LAW 7525	Law and Economic Development	
LAW 7527	Public Health Legal Clinic	
LAW 7526	Juvenile Courts: Delinquency, Abuse, Neglect	
LAW 7550	Refugee and Asylum Law	
LAW 7555	Communications Law	
LAW 7561	Private Litigation in the Public Interest	
LAW 7582	Elder Law	
LAW 7588	Reproductive and Sexual Rights and Health	
LAW 7589	International Health Law: Governance, Development, and Human Rights	
LAW 7600	Current Issues in Health Law and Policy	
LAW 7602	Bioproperty	
LAW 7606	Drug Law and Policy	
LAW 7617	Economic Perspectives on Health Policy	
LAW 7630	Global Health	

Program Credit/GPA Requirements

42 total semester hours required for MPH. Please contact the School of Law (https://www.northeastern.edu/law/academics/jd/dual-degrees) for JD requirements.
Minimum 3.000 GPA required

Plan of Study

Year 1

Fall	Hours	Spring	Hours	Summer Full Semester	Hours
First-year law courses		First-year law courses		Law co-op	
	0		0		0

Year 2

Fall	Hours	Spring	Hours	Summer Full Semester	Hours
PHTH 5202	3	PHTH 5212	3	PHTH 5540	3
PHTH 5210	3	PHTH 5214	3	LAW 7443	3
PHTH 6200	3	PHTH 5220	3		
PHTH 6204	3	PHTH 6208	3		
	12		12		6

Year 3

Fall	Hours	Spring	Hours	Summer Full Semester	Hours
PHTH 6966	3	Law school courses		Law school courses	
Law co-op		Law co-op			
	3		0		0

Year 4

Fall	Hours	Spring	Hours
PHTH 6910	3	February bar exam	
	3		0

Total Hours: 36

Physician Assistant Studies and Health Informatics, MS/MS

The Northeastern University health informatics and physician assistant combined program allows qualified and interested students to achieve their goal of obtaining a more robust understanding of healthcare technology while also completing robust clinical training in the physician assistant program. This prepares a select group of exceptionally qualified clinicians to become leaders in healthcare technology application and development and fosters interdisciplinary collaboration in order to address problems in the healthcare and health information environments both locally and across the globe. The joint program is designed to provide students a greater understanding of technological issues in clinical practice, quantitative methods, and the use of scientific evidence and cutting-edge technology to optimize clinical workflows and improve patient outcomes.

This dual degree takes 34 months to complete (as opposed to 48, if each degree were pursued separately), and a total number of 8 credits are shared between both degrees.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Physician Assistant Requirements

A grade of C or higher is required in each course.

Didactic Courses		
PA 6200	Anatomy and Physiology 1	3
PA 6201	Anatomy and Physiology 2	3
PA 6203	Physical Diagnosis and Patient Evaluation 1	3
PA 6204	Physical Diagnosis and Patient Evaluation 2	3
PA 6205	Pharmacology 1	2
PA 6206	Pharmacology 2	2
PA 6207	Clinical Laboratory and Diagnostic Methods	4
PA 6208	Professional Issues for Physician Assistants	2
PA 6311	Principles of Medicine 1	4
PA 6312	Principles of Medicine 2	4
PA 6313	Principles of Medicine 3	4
PA 6320	Principles of Obstetrics and Gynecology	2
PA 6321	Principles of Surgery	2
PA 6322	Principles of Orthopedics	2
PA 6323	Clinical Neurology	2
PA 6324	Principles of Pediatrics	2
PA 6325	Principles of Psychiatry	2
PA 6326	Aspects of Primary Care	4
PA 6327	Emergency Medicine and Critical Care	2
PA 6328	Aging and Rehabilitation Medicine	2
PA 6329	Healthcare Delivery	2
Clinical Courses		
PA 6400	Applied Study in Medicine	5
PA 6401	Applied Study in Ambulatory Medicine	5
PA 6402	Applied Study in Family Practice	5
PA 6403	Applied Study in Emergency Medicine	5
PA 6404	Applied Study in Obstetrics and Gynecology	5
PA 6405	Applied Study in Pediatrics	5
PA 6406	Applied Study in Surgery	5
PA 6407	Applied Study in Mental Health	5
PA 6408	Applied Study Elective	5

Health Informatics Requirements

A grade of B– or higher is required in each course.

Core Requirement		
HINF 7701	Health Informatics Capstone Project	3
Business Management Core		
Complete two courses from the following:		6
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management	
HINF 6202	Business of Healthcare Informatics	
HINF 6215	Project Management	

HINF 6240	Improving the Patient Experience through Informatics	
HINF 6335	Management Issues in Healthcare Information Technology	
PHTH 5226	Strategic Management and Leadership in Healthcare	
Health Informatics Core		
Complete two courses from the following:		6
HINF 5102	Data Management in Healthcare	
HINF 5110	Global Health Information Management	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 6205	Creation and Application of Medical Knowledge	
HINF 6350	Public Health Surveillance and Informatics	
HINF 6404	Patient Engagement Informatics and Analytics	
HINF 6405	Quantifying the Value of Informatics	
PHTH 5232	Evaluating Healthcare Quality	
Technical Core		
PHTH 5202	Introduction to Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
Electives		
Complete two courses from the following:		6
HINF 6325	Legal and Social Issues in Health Informatics	
HINF 6330	Emerging Technologies in Healthcare	
HINF 6345	Design for Usability in Healthcare	
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	

Program Credit/GPA Requirements

128 total semester hours required
Minimum 3.000 GPA required

Aging, Graduate Certificate

The purpose of this program is to provide interprofessional education to meet the specific healthcare needs of older adults. The interprofessional aging certificate program will consist of four graduate courses. As an interactive online program, the interprofessional certificate program in healthy aging is designed for the 21st-century professional requiring the flexibility that online education allows.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in each course.

HLTH 5005	Introduction to Health and Aging	3
HLTH 5010	Health and Aging: Special Considerations	3
HLTH 5015	Health Assessment in Older Adults	3
HLTH 5020	Seminar and Capstone Project: Contemporary Issues in Aging	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Biopharmaceutical Analytical Sciences, Graduate Certificate

The Graduate Certificate in Biopharmaceutical Analytical Sciences has been designed in response to a need in the biotechnology industry for individuals with an advanced knowledge of the principles and practices of state-of-the-art analyses of protein with focus on the characterization of innovator and biosimilars. Individuals, particularly those who are working in the various sectors of biotechnology including basic research of biological systems, discovery, development, and manufacturing of biopharmaceuticals, have an opportunity to improve their competency and learn new practical skills that enable them to increase productivity and further contribute to their professions. In addition, the certificate was designed for both individuals with and without experience in biopharmaceuticals and their analysis.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

CHEM 5616	Protein Mass Spectrometry	3
CHEM 5617	Protein Mass Spectrometry Laboratory	3
CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis	3
CHEM 5660	Analytical Biochemistry	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Early Intervention, Graduate Certificate

Northeastern University's Graduate Certificate in Early Intervention program is an interdisciplinary, preservice training program that is designed to fulfill requirements for certification as an early intervention specialist, at the advanced provisional level, as set forth by the Massachusetts Department of Public Health (DPH). The interdisciplinary nature of the program is facilitated by the interaction of students from school psychology, counseling psychology, physical therapy, speech and language pathology, human services, psychology, and other disciplines who participate in the program.

The goals for the early intervention certificate program are:

- To prepare personnel to provide services to infants and toddlers with disabilities, and their families, from linguistically and culturally diverse backgrounds in urban environments
- To prepare personnel who have attained all competencies relative to early intervention, specified by the Massachusetts DPH, and that are consistent with best practice and research

- To prepare personnel in an interdisciplinary manner, drawing from Northeastern University's multidisciplinary resources
- To prepare personnel to function effectively across teams (individualized family service plan teams, community teams, interagency teams) and to understand the roles of their interdisciplinary teammates

The program is delivered in a hybrid format: Classes meet on campus one day each month, and additional course content is delivered through online distance education. The program can be taken alone or integrated with bachelor's, master's, or clinical doctoral degree programs. Personnel who are working in the field may use their work site for field training. Degree-bearing programs incorporate the courses in alternative arrangements (e.g., Master of Science/Certificate of Advanced Graduate Study in School Psychology, Master of Science in Speech-Language Pathology, Master of Science in Counseling Psychology), meaning that some classes stand in place for others. These program plans are worked out with your advisors.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B or higher is required in all courses.

Early Intervention		
CAEP 5150	Early Intervention: Family Systems	3
CAEP 5151	Early Intervention: Infant and Toddler Development, Risk, and Disability	3
CAEP 5152	Early Intervention: Planning and Evaluating Services	3
SLPA 6335	Early Intervention: Assessment and Intervention	3
Practicum		
CAEP 8425	Early Intervention Practicum 1	2
CAEP 8426	Early Intervention Practicum 2	2

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Health Informatics Management and Exchange, Graduate Certificate

The certificate program in health informatics management and exchange offers you the opportunity to obtain the knowledge needed to support the collection, management, retrieval, and exchange of electronic health data. It is designed to prepare you for a position as a specialist in data management, interoperability standards, and health database design.

- Eight-month program
- Five courses, 15 semester hours

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in all course work.

Health Informatics Core		
HINF 5101	Introduction to Health Informatics and Health Information Systems	3
HINF 5102	Data Management in Healthcare	3
Management and Exchange		
HINF 6205	Creation and Application of Medical Knowledge	3
HINF 6220	Database Design, Access, Modeling, and Security	3
HINF 6355	Key Standards in Health Informatics Systems	3

Program Credit/GPA Requirements

15 total semester hours required
Minimum 3.000 GPA required

Health Informatics Privacy and Security, Graduate Certificate

The certificate program in health informatics privacy and security combines knowledge of health informatics with a strong foundation in important information security issues. Northeastern's status as a National Security Agency Center of Excellence for Information Security Education and Research ensures the program is both relevant and of high academic quality.

- Eight-month program
- Five courses, 18 semester hours

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in all course work.

Health Informatics Core		
HINF 5101	Introduction to Health Informatics and Health Information Systems	3
HINF 5102	Data Management in Healthcare	3
Privacy and Security		
IA 5130	Computer System Security	4
IA 5150	Network Security Practices	4
IA 5200	Security Risk Management and Assessment	4

Program Credit/GPA Requirements

18 total semester hours required
Minimum 3.000 GPA required

Health Informatics Software Engineering, Graduate Certificate

This certificate program offers software engineers the background in health informatics as well as interchange and interoperability standards needed to better understand the context in which they work and perform effectively in a health-related organization. Program design is flexible to allow completion on a rapid schedule or a slower pace that is more compatible with full-time workers.

- Eight-month program
- Five courses, 15 semester hours

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of B– or higher is required in all course work.

Health Informatics Core		
HINF 5101	Introduction to Health Informatics and Health Information Systems	3
HINF 5102	Data Management in Healthcare	3
Management and Exchange		
HINF 6205	Creation and Application of Medical Knowledge	3
HINF 6355	Key Standards in Health Informatics Systems	3
HINF 6345	Design for Usability in Healthcare	3

Program Credit/GPA Requirements

15 total semester hours required
Minimum 3.000 GPA required

School of Law

Website (http://www.northeastern.edu/mls)

Jeremy R. Paul, JD, Dean

Dan Danielsen, JD, Associate Dean for Academic Affairs
Wendy E. Parmet, JD, Associate Dean for Entrepreneurial Programs and Research Support
Gregory Tilley, MBA, Associate Dean for Finance and Administration

Northeastern University School of Law
400 Huntington Avenue
Boston, MA 02115
617.373.5149
lawweb@northeastern.edu

Programs

Master of Legal Studies (MLS)

- Legal Studies—Online (p. 269)

Graduate Certificate

- Business Law (p. 270)
- Health Law (p. 271)
- Human Resources Law (p. 271)
- Intellectual Property Law (p. 272)

Legal Studies, MS—Online

This degree is designed for professionals who want a deeper understanding of law and legal concepts. Such professionals may be found in nonprofit organizations, foundations, financial services firms, pharmaceutical companies, insurance firms, compliance departments, or a host of other commercial and noncommercial settings. Examples of the professionals who would be interested in this degree are human resource professionals, claims representatives for insurance companies, professionals in healthcare organizations, bank loan officers, real estate brokers, risk managers, government affairs officers, management consultants advising organizations, development officers working on planned giving, and software entrepreneurs. They desire to know more about the law and to be able to deal more effectively with the lawyers with whom they interact during their professional lives. The degree includes concentrations in human resources law, business law, intellectual property law, and health law.

Program Plan

Students take one 3-semester-hour course per term. A term is approximately eight weeks; there are two terms (A and B) in each of three semesters (fall, spring, and summer). The course work is spread over 10 terms or five semesters. Every student in their first semester takes two required foundation courses. Students then take four out of five core courses, plus three or four elective courses from any of four concentrations. Students choosing not to concentrate may take courses from any concentration.

Program Features

TOTAL DEGREE CREDIT REQUIRED

The program requires 30 semester hours.

COURSE ORGANIZATION

The program comprises 10 courses:

- Each course is eight weeks
- Two courses are taken per semester
- Each course is 3 semester hours
- Course types:
  - Two foundation courses
  - Four or five core courses
  - Three or four elective courses

CONCENTRATIONS

The program includes four concentrations plus a general track. The concentrations are:

- Business Law
- Health Law
- Human Resources Law
- Intellectual Property Law

ACADEMIC STRUCTURE

- Six eight-week sessions per calendar year:
  - Spring A
  - Spring B
  - Summer A
  - Summer B
  - Fall A
  - Fall B
- Two eight-week courses (3 semester hours each) back-to-back in each 16-week semester
- Total of 10 courses needed to graduate

TIME TO DEGREE COMPLETION

Normal completion time is five semesters of part-time study, with students taking one course at a time.

ADMISSION CYCLES

- Fall 1 session
- Spring 1 session
- Summer 1 session

ADMISSION REQUIREMENTS

- Bachelor's degree from regionally accredited institution
- Online application
- Application fee—none
- Personal statement with designated questions to be answered
- Two letters of recommendation
- TOEFL for international students
- Transcripts from all previous higher educational institutions attended.
- Professional resumé

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Foundation Courses

LS 6101	Introduction to Legal Studies 1: Law and Legal Reasoning	3
LS 6102	Introduction to Legal Studies 2	3

Core Courses

Complete at least four of the following:		12-15
LS 6110	Law of Information and Records	3
LS 6120	Law and Strategy	3
LS 6130	Negotiation and Advocacy	3
LS 6140	Regulation and Compliance	3
LS 6150	Law and Organizational Management	3

Specialization Elective Courses

Complete three or four of the following:		9-12
LS 6160	Regulation and Global Business Strategies	3
LS 6170	Financial Transactions	3
LS 6180	Health Law Survey	3
LS 6181	Healthcare Regulation and Compliance	3
LS 6182	Patient Records, Privacy, and Security	3
LS 6210	Special Topics in Employee Rights and Employer Obligations	3
LS 6211	Antidiscrimination Law	3
LS 6212	Wages and Benefits	3
LS 6230	Intellectual Property Survey	3

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Business Law, Graduate Certficate

Program ABA Pending Approval

The Graduate Certificate in Business Law is designed to provide professionals in large and small enterprises with an ability to recognize, navigate, and leverage the laws that regulate business organizations and transactions.

Program Plan

Students take one 3-credit course per term. Each term is approximately eight weeks, and there are two terms (A and B) in each of three semesters (fall, spring, and summer). The course work may be spread over two or three semesters. Every student begins the program by taking a required foundation course (Introduction to Legal Studies II). Students then take three additional required courses, each that focuses specifically on health law.

Program Features

TOTAL CERTIFICATE CREDIT REQUIREMENT

The program requires 12 semester hours.

COURSE ORGANIZATION

The program comprises four courses:

- Each course is eight weeks
- One or two courses are taken each semester
- Each course is 3 semester hours
- Course type:
  - One foundation course
  - Three certificate-specific courses

ACADEMIC STRUCTURE

- Six eight-week sessions per calendar year:
  - Fall A
  - Fall B
  - Spring A
  - Spring B
  - Summer A
  - Summer B

One or two eight-week courses (3 semester hours each) taken in one to three semesters.

Total of four courses needed to complete certificate.

TIME TO CERTIFICATE COMPLETION

Normal completion time is two to three semesters (depending upon course sequencing) of part-time study, with students taking one course at a time.

ADMISSIONS CYCLES

- Fall B
- Spring B
- Summer B

ADMISSIONS REQUIREMENTS

- Bachelor's degree from regionally accredited institution
- Online application
- Application fee—none
- Personal statement with designated questions to be answered
- One letter of recommendation
- TOEFL for international students
- Transcripts from all previous higher educational institutions attended
- Professional resumé

Program Requirements

Program Pending ABA Approval

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

LS 6102	Introduction to Legal Studies 2	3
LS 6170	Financial Transactions	3

LS 6160	Regulation and Global Business Strategies	3
Complete one of the following:		3
LS 6230	Intellectual Property Survey	
LS 6210	Special Topics in Employee Rights and Employer Obligations	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Health Law, Graduate Certificate

The Graduate Certificate in Health Law is designed to provide professionals who work in healthcare with the skills needed to recognize, navigate, and leverage the many legal issues that arise within this heavily regulated industry.

Program Plan

Students take one 3-credit course per term. Each term is approximately eight weeks, and there are two terms (A and B) in each of three semesters (fall, spring, and summer). The course work may be spread over two or three semesters. Every student begins the program by taking a required foundation course (Introduction to Legal Studies 2 (LS 6102). Students then take three additional required courses, each that focuses specifically on health law.

Program Features

TOTAL CERTIFICATE CREDIT REQUIREMENT

The program requires 12 semester hours.

COURSE ORGANIZATION

The program comprises four courses:

- Each course is eight weeks
- One or two courses are taken each semester
- Each course is 3 semester hours
- Course type:
  - One foundation course
  - Three certificate-specific courses

ACADEMIC STRUCTURE

- Six eight-week sessions per calendar year:
  - Fall A
  - Fall B
  - Spring A
  - Spring B
  - Summer A
  - Summer B

One or two eight-week courses (3 semester hours each) taken in one to three semesters.

Total of four courses needed to complete certificate.

TIME TO CERTIFICATE COMPLETION

Normal completion time is two to three semesters (depending upon course sequencing) of part-time study, with students taking one course at a time.

ADMISSIONS CYCLES

- Fall B
- Spring B
- Summer B

ADMISSIONS REQUIREMENTS

- Bachelor's degree from regionally accredited institution
- Online application
- Application fee—none
- Personal statement with designated questions to be answered
- One letter of recommendation
- TOEFL for international students
- Transcripts from all previous higher educational institutions attended
- Professional resumé

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

LS 6102	Introduction to Legal Studies 2	3
LS 6180	Health Law Survey	3
LS 6181	Healthcare Regulation and Compliance	3
LS 6182	Patient Records, Privacy, and Security	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Human Resources Law, Graduate Certificate

The Graduate Certificate in Human Resources Law is designed to provide professionals who work in human resources with the skills needed to recognize, navigate, and leverage the many legal issues that arise within this heavily regulated field.

Program Plan

Students take one 3-credit course per term. Each term is approximately eight weeks, and there are two terms (A and B) in each of three semesters (fall, spring, and summer). The course work may be spread over two or three semesters. Every student begins the program by taking a required foundation course (Introduction to Legal Studies 2 (LS 6102)). Students then take three additional required courses, each that focuses specifically on health law.

Program Features

TOTAL CERTIFICATE CREDIT REQUIREMENT

The program requires 12 semester hours.

COURSE ORGANIZATION

The program comprises four courses:

- Each course is eight weeks
- One or two courses are taken each semester
- Each course is 3 semester hours
- Course type:
  - One foundation course

- Three certificate-specific courses

ACADEMIC STRUCTURE

- Six eight-week sessions per calendar year:
  - Fall A
  - Fall B
  - Spring A
  - Spring B
  - Summer A
  - Summer B

One or two eight-week courses (3 semester hours each) taken in one to three semesters.

Total of four courses needed to complete certificate.

TIME TO CERTIFICATE COMPLETION

Normal completion time is two to three semesters (depending upon course sequencing) of part-time study, with students taking one course at a time.

ADMISSIONS CYCLES

- Fall B
- Spring B
- Summer B

ADMISSIONS REQUIREMENTS

- Bachelor's degree from regionally accredited institution
- Online application
- Application fee—none
- Personal statement with designated questions to be answered
- One letter of recommendation
- TOEFL for international students
- Transcripts from all previous higher educational institutions attended
- Professional resumé

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

LS 6102	Introduction to Legal Studies 2	3
LS 6210	Special Topics in Employee Rights and Employer Obligations	3
LS 6211	Antidiscrimination Law	3
LS 6212	Wages and Benefits	3

Program Credit/GPA Requirements

12 total semester hours required

Minimum 3.000 GPA required

Intellectual Property Law, Graduate Certificate

Program Pending ABA Approval

The Graduate Certificate in Intellectual Property Law is designed to provide professionals who work in intellectual property, technology transfer, licensing, or related areas, as well as inventors and entrepreneurs, with the skills they need to recognize and protect intellectual property rights.

Program Plan

Students take one 3-credit course per term. Each term is approximately eight weeks, and there are two terms (A and B) in each of three semesters (fall, spring, and summer). The course work may be spread over two or three semesters. Every student begins the program by taking a required foundation course (Introduction to Legal Studies 2 (LS 6102). Students then take three additional required courses, each that focuses specifically on health law.

Program Features

TOTAL CERTIFICATE CREDIT REQUIREMENT

The program requires 12 semester hours.

COURSE ORGANIZATION

The program comprises four courses:

- Each course is eight weeks
- One or two courses are taken each semester
- Each course is 3 semester hours
- Course type:
  - One foundation course
  - Three certificate-specific courses

ACADEMIC STRUCTURE

- Six eight-week sessions per calendar year:
  - Fall A
  - Fall B
  - Spring A
  - Spring B
  - Summer A
  - Summer B

One or two eight-week courses (3 semester hours each) taken in one to three semesters.

Total of four courses needed to complete certificate.

TIME TO CERTIFICATE COMPLETION

Normal completion time is two to three semesters (depending upon course sequencing) of part-time study, with students taking one course at a time.

ADMISSIONS CYCLES

- Fall B
- Spring B
- Summer B

ADMISSIONS REQUIREMENTS

- Bachelor's degree from regionally accredited institution
- Online application
- Application fee—none
- Personal statement with designated questions to be answered
- One letter of recommendation
- TOEFL for international students
- Transcripts from all previous higher educational institutions attended
- Professional resumé

Program Requirements

Program Pending ABA Approval

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

LS 6102	Introduction to Legal Studies 2	3
LS 6230	Intellectual Property Survey	3
LS XXXX		3
LS XXXX		3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

College of Professional Studies

Website (http://www.cps.neu.edu/degree-programs/graduate)

Mary Loeffelholz, PhD, Interim Dean of the College of Professional Studies and Vice President of Professional Education

David Fields, PhD, Assistant Dean of Faculty and Academic Affairs
Lydia Young, PhD, Interim Associate Dean of Academic and Faculty Affairs; Director of Graduate School of Education

50 Nightingale Hall
877.668.7727
617.373.2400

Academic Policies and Procedures

Master's Degree Admission Requirements

Note that all master's degrees offered through the College of Professional Studies (CPS) have the following admission requirements:

- Online application
- Statement of purpose (500–1,000 words)
- Professional resumé
- Official undergraduate transcript(s) noting conferral of a bachelor's degree
- Two letters of recommendation
- English-language proficiency proof (for non-native English-language speakers)
- TOEFL, IELTS, or TOEIC scores

Some programs have additional requirements.

Transfer Credit Policies

All graduate transfer credit awards are made on a case-by-case basis. Transfer credit awards are made for eligible courses successfully completed at regionally and programmatically accredited institutions. The Council for Higher Education Accreditation provides information about the organizations responsible for these two forms of accreditation. Official transcripts from all institutions should be sent directly to the College of Professional Studies Office of Admissions at the time of application.

Students seeking transfer credits earned at institutions outside the United States should submit an official English evaluation completed by an approved credential evaluator. Course descriptions and/or syllabi also should be translated into English and submitted to the College of Professional Studies Office of Admissions.

A maximum of 12 quarter hours or two courses obtained at another institution may be accepted as transfer toward the degree, provided the credits consist of work taken at the graduate level for graduate credit, carry minimum grades of B (or 3.000 on a 4.000 scale), have been earned at an accredited institution or equivalent, and have not been used toward any baccalaureate or advanced degree or certificate of advanced graduate study at another institution.

Transfer credits must be no more than five academic years old at the time the student is admitted to graduate study. Courses older than five years will be accepted only in rare circumstances.

Graduate Certificate Transfer Credit Policies

- A maximum of 4 quarter hours (one course) of transfer credit

Master Degree Transfer Credit Policies

- A maximum of 12 quarter hours of transfer credit

Doctoral Degree Transfer Credit Policies

- A maximum of 9 quarter hours of transfer credit for Doctor of Education students
- A maximum of 8 quarter hours of transfer credit for Transitional Doctor of Physical Therapy students
- No transfer credit is awarded for students in the Doctor of Law and Policy program

Special Student Status

Graduate applicants to the College of Professional Studies may be eligible to take up to two graduate (nondoctoral) courses toward their program while completing the formal application process by seeking special student status (http://www.cps.neu.edu/admissions/graduate/special-students.php).

- Students taking courses under special student status are expected to satisfy applicable course prerequisites before enrolling in a course.

- Students taking courses under special student status are not eligible for financial aid.
- Special student status does not guarantee acceptance.
- The maximum number of courses students may take under special student status is two. After completing two courses, students will be blocked from further course registration until they have been officially accepted into a program.

The following programs are not available for special student status: Master of Arts in Teaching (MAT); Master of Education, Special Education Concentration; Master of Science in Applied Nutrition; Doctor of Education; Doctor of Law and Policy.

Special student status is not an option for students seeking an F-1 visa.

Personal Professional Enrichment (PPE)

Students interested in taking graduate-level (nondoctoral) courses for personal or professional enrichment (PPE) need to complete an online application (http://www.cps.neu.edu/admissions/graduate) as a PPE student. Once approved, students will be able to register through their myNEU account.

- Students on PPE status are expected to satisfy applicable course prerequisites before enrolling in a course.
- Students taking courses while on PPE status may elect to apply to a graduate certificate or degree program by completing the formal application process (http://www.cps.neu.edu/admissions/graduate). Up to two qualifying courses (or 8 credits) completed while on PPE status may be applied to the intended program of study. To be eligible, the minimum earned grade for the course(s) must be B.
- Students taking courses under PPE status are not eligible for financial aid.

PPE status is not an option for students seeking an F-1 visa.

New Student Orientation (On-Ground and Online)

All newly accepted College of Professional Studies students are required to attend the on-ground orientation or participate in online orientation. The purpose of New Student Orientation is to provide information and tools for each student's success from the point of program entry to degree completion.

Students are encouraged to use the online orientation, accessed via NU Online, as a resource throughout their career at the College of Professional Studies.

For additional information, visit the College of Professional Studies webpage (http://www.cps.neu.edu/student-resources/orientation.php).

Academic Resources

Interactive Academic Integrity Checklist (IAIC)

The Interactive Academic Integrity Checklist (IAIC) is a Flash-based tool students can use before they turn in every assignment to ensure that they have not accidentally committed any of the most common violations of the academic integrity policy. Additionally, the IAIC contains links to examples of APA- and MLA-style formatting. See the version for desktop internet browsers (http://nuonline.adobeconnect.com/academicintegritychecklist) or the version for mobile devices (http://nuonline.adobeconnect.com/academicintegritychecklist_mobile).

Global Student Success

10 Belvedere
617.373.2455
globalss@neu.edu
www.cps.neu.edu/gss (http://www.cps.neu.edu/gss)

Global Student Success is committed to supporting the success of international students at Northeastern University through cross-cultural, linguistic, and academic support services. We also partner with faculty, staff, and administrators to integrate global dimensions and cross-cultural understanding into the Northeastern experience.

International Tutoring Center

Basement of Snell Library
617.373.2455
globalss@neu.edu
www.cps.neu.edu/gss (http://www.cps.neu.edu/gss)

Tutors provide high-quality ESL writing instruction and tutoring for international students who need assistance with papers, assignments, TOEFL writing, and research projects. Students can meet one-on-one with an ESL tutor for 50-minute appointments. This is a free service for Northeastern international students.

Smarthinking

Smarthinking is a free online tutoring service accessed through the student's NU Online account for College of Professional Studies students.

Online tutoring sessions can be synchronous or asynchronous. Many different subjects such as writing, reading, basic math through multivariate calculus, business, biology, chemistry, and physics are available.

Attendance Requirements

Class participation is essential to success no matter the course format or its delivery.

Attendance requirements vary. It is the student's responsibility to ascertain what each instructor requires. If a student will be absent for any reason (e.g., illness, religious beliefs, or jury duty), it is his or her responsibility to inform the instructor and to abide by the attendance requirements as explained in the course syllabus. Unexplained absence from class or failure to meet a course deadline may seriously affect the student's academic progress and may result in a final grade of F.

"I Am Here" (IAH) Process

After course registration, students are required to verify their intent to enroll in College of Professional Studies class(es) through their myNEU account during the first week of each class start. This verification process is called "I Am Here" (IAH). Students who fail to complete this process on time will be dropped from the class(es), which may impact their financial aid or international student visa eligibility.

Students are responsible for ensuring completion of the IAH process, which requires that they do not log out of the system early. Students who do not receive a "Successful Completion" message have not reached the end of the procedure and must start again. Sometimes it may take 24 hours before students can restart the procedure.

Students registering for the first time after the start of classes will be considered "Here" for the semester.

Students who experience difficulty with the process or have questions should email the Office of the Registrar (registrar@northeastern.edu).

Nonattendance

Nonattendance does not constitute official course dropping or withdrawal, which means the student is fully responsible for the academic and financial consequences.

A student who registers for a course and completes the IAH process but does not officially drop the course by the deadline, regardless of his or her level of participation or attendance/nonattendance, is responsible for paying 100 percent of the tuition charges and applicable fees and the final earned grade. A student in this situation may earn an F grade that will be part of his or her permanent academic record.

Like all grades for courses attempted and/or completed, a grade earned due to nonattendance impacts a student's academic progression, an international student's visa eligibility, and a federal financial aid recipient's aid eligibility and award.

Reentry to Program

Application for reentry into any academic program is required of students whose studies are interrupted voluntarily for a period of one to three years. Students who are dismissed academically must wait at least one year before applying for reinstatement.

Students are expected to meet the requirements of the program curriculum current at the time of the approved reentry. If a student does not enroll in the term in which he or she was approved for reentry, he or she must follow the curriculum requirements for the term in which he or she resumes course work with approval. If a student waits for more than one year to resume his or her studies after being approved for reentry, he or she will have to apply for reentry again.

If the program into which the student is seeking reentry is no longer offered, the student may choose to enroll in another program if he or she meets the admissions requirements for that program. Contact the Office of Academic Advising (http://www.cps.neu.edu/student-resources/OAA.php) for assistance and to complete the appropriate form.

Readmission to Program

A new admission application is required of students whose studies are interrupted voluntarily for more than three years.

Students are expected to meet the requirements of the program curriculum current at the time of the approved readmission. If the program into which the student is seeking readmission is no longer offered, the student may apply to another program and must meet the admissions requirements for that program. Contact the Office of Admissions (http://www.cps.neu.edu/admissions) for assistance and to complete the admission application.

If readmitted, transfer credits that a student was previously awarded will be reevaluated following the transfer credit award rules current at the time of readmission. It is at the discretion of the academic program to determine applicability of courses previously completed.

Full-Time Status

A graduate (nondoctoral) student is considered a full-time student if he or she is enrolled in 9 quarter hours of graduate credit for the quarter. An exception is made for students matriculated in master's degree programs that only require 4-credit courses, in which case full-time student status is attained with enrollment in 8 quarter hours of graduate credit for the quarter.

A doctoral student's full-time status is determined by the structure of the program.

Note that full-time status may be defined differently for federal loan purposes. International students have other considerations/requirements to maintain their visa eligibility.

Course Load

Federal financial aid recipients must be enrolled in and successfully complete a minimum number of credits each term to maintain eligibility. For more information, contact your financial aid counselor.

Course Overload

A maximum course load (different from full-time status) for a graduate (nondoctoral) student is 16 credits taken across a twelve-week term, with no more than 8 credits per six-week session.

To be eligible for a course overload (greater than 16 credits per twelve-week term or greater than 8 credits per six-week session), a graduate (nondoctoral) student must:

- Have a record of successful study with 12 or more credits a term at Northeastern University
- Have a minimum cumulative grade-point average of 3.500
- Provide a rationale to support the request

Students need to complete the appropriate form (http://cps.neu.edu/student-resources/academic-forms.php) and return it to their student success specialist (http://cps.neu.edu/student-resources/OAA-Staff.php). Course overload is approved per term.

Each doctoral program has its own enrollment and course load requirements. Doctoral students who wish to seek a course overload must consult with the program director or designee.

International Student Enrollment Requirements

In order to maintain lawful student status in the United States, international students must be mindful of the rules and regulations that govern their nonimmigrant visa classification. Numerous U.S. federal regulations make it especially important for students in the "F" (student) and "J" (exchange visitor) categories to consult regularly with an international student advisor at the International Student and Scholar Institute (ISSI) before taking any action that might impact their immigration status and educational endeavors in the United States.

All international students in F or J status must register before each quarter starts. It is strongly recommended that international students register for an appropriate full-time course load at least two weeks before the quarter starts. Any exceptions from full-time registration requirements must be preapproved by the OGS in accordance with specified regulations.

In the College of Professional Studies, there are four quarters that make up each academic year. Each twelve-week quarter (term) in fall, winter, and spring is made up of Parts of Term (courses that are scheduled for less than twelve weeks). Some courses are scheduled for the entire twelve weeks of a quarter, while others are scheduled for either the first six weeks or the last six weeks. A full summer term is eight weeks with Parts of Term as well. Students in F-1 and J-1 status must remain registered at all times during a quarter to remain in compliance.

International students are not allowed to take courses during only one-half of an academic quarter. Restrictions on course formats apply to international student enrollment requirements.

To achieve full-time status, graduate and doctoral international students must be enrolled in 8 - 9 credits each quarter. International students should consult with their student success specialist to develop a course plan to maintain their international student status.

For a 9-credit course load, international students must take at least 6 credits of courses that are held on campus, in the blended or hybrid format. Students may not take classes on campus for just the first or second six weeks of an eight or twelve-week quarter and then take only online courses during the other half of the term. For an 8-credit course load, international students must take at least 4 credits of courses that are held on campus, in blended or hybrid format. Students may not take classes on campus for just the first or second six weeks of an eight or twelve-week quarter and then take only online courses during the other half of the term.

Full-time status must be maintained for F-1 visa students throughout the academic year with the following exceptions:

- A student whose first term is *not* summer does not need to be enrolled in the summer term.
  - If a student's first term of enrollment is summer, he or she must be enrolled full-time that summer. For the second and subsequent summer terms, he or she does not need to be enrolled.
- In the final academic term of a student's program of study, enrollment may be for fewer than 9 credits, but it must either be on campus or a combination of on campus and online throughout the entire term.
- Contact the OGS (http://www.northeastern.edu/issi/contactus.html) if you would like or need one-on-one guidance and assistance on the vast array of federal requirements and procedures related to immigration and maintaining your legal status throughout your studies.

Directed Study

Directed studies are offered when a course is required for a student's program of study but said course is not available in a given academic term and there is immediacy for a student to complete said course. Academic deans/directors will make the decision if there is a compelling need to run a course as a directed study.

Independent Study

Independent study is an opportunity for a degree student to work independently under the supervision of an instructor to undertake special research, literature review, or experimental study projects in areas related to his or her program of study that he or she cannot accomplish as part of a standard course in the curriculum. A degree student may take up to two independent studies. The work to be done for an independent study is usually crafted by the student, with faculty input. Independent studies are entirely optional and not needed to graduate. A completed Request for Independent Study form (http://www.cps.neu.edu/student-resources/academic-forms.php), signed by both the student and the faculty member, must be submitted to the academic program for review and approval.

Active-Duty Military Personnel

As a member of the Service Member Opportunity Colleges, the College of Professional Studies' academic residency requirement is different for active-duty service members. Active-duty service members are required to complete 30 percent of the graduate certificate/degree program at the College of Professional Studies.

Registration and Taking Courses

Course Registration

For course registration information, visit the College of Professional Studies webpage (http://www.cps.neu.edu/class-registration).

Course registration procedures are as follows:

- Newly accepted and returning students add or drop courses through their myNEU account any time during the registration period.
- Certificate- and degree-seeking students whose studies have been interrupted voluntarily for one to three years or more need to first apply for reentry through the Office of Academic and Student Support Services before registering for course(s).
- Global program students should consult with their program to determine if they need to register on their own or if the program will register them.

All students need to be mindful of the college's course add/drop policies and deadlines to register as early as possible with the intent to secure a spot in the preferred course and to avoid being charged in full for missing the course drop/withdrawal deadline.

Auditing a Course

Graduate (nondoctoral) students are permitted to audit graduate (nondoctoral) courses, but they must complete the usual registration process and pay regular tuition fees. There is no reduction in fees for auditing.

An auditor may participate in class discussions, complete papers and projects, and take tests and examinations for informal evaluation. Regardless of the amount or quality of work completed, however, no academic credit will be granted at any time for audited courses. In addition, audited courses may not be used in the determination of enrollment status for financial aid purposes and do not count toward program completion.

The student's decision to audit a course must be communicated in writing to the Office of the University Registrar before the fourth class meeting for 12-week courses. For 4-, 6-, and 8-week courses, requests must be received by the second class meeting. No exception to this procedure may be approved without the authorization of the college's academic standing committee.

If approved, the student should inform the instructor of his or her status as auditor of the course.

Course Selection and Planning

Students should refer to their degree audits for program curriculum information, to select courses, and to monitor their progress toward degree completion. Students should access their degree audits through their myNEU account or request an audit from their student success specialist. Degree audits are unofficial records of academic progress.

Students are encouraged to consult with their student success specialist about their academic planning.

Course Prerequisites

Course prerequisites are courses that are required to have been completed prior to enrolling in another course. Before registering for a course through their myNEU account, students, regardless of matriculation status, should consult the College of Professional Studies website (http://www.cps.neu.edu/degree-programs/prerequisites.php) to determine whether they have satisfied the course prerequisites.

Course Corequisites

Course corequisites are courses that are required to be taken concurrently. Before registering for a course through their myNEU account, students, regardless of matriculation status, should read the course description to determine if there is a corequisite requirement and register for both courses.

Repeating a Course

If a student wishes to improve his or her cumulative grade-point average (GPA) by repeating a course, he or she may do so . A student may take the same course up to three times to earn a better grade. Only the grade earned in the last attempt is used to compute the GPA while all grades remain part of the student's permanent academic record. A student is required to pay the normal tuition charges for all repeated courses. A student may not repeat more than two courses or 8 quarter hours of credit, whichever is greater, to satisfy the requirements of the degree.

Financial aid recipients must be mindful that repeating a course could impact their aid eligibility. Students with questions about this possible impact should contact their financial aid counselor.

Course Waiver

A course waiver may be awarded to a student who has completed the equivalent course at an accredited institution other than the College of Professional Studies in the past five years. The waiver will exempt the student from completing the required course. The student will complete another course, as approved by the program, to satisfy the number of credits required for the program.

Doctoral students must consult with their academic program to determine if course waivers are permitted.

Course Formats and Credits

Visit the College of Professional Studies webpage (http://www.cps.neu.edu/class-registration/course-formats.php) for information on course formats.

The College of Professional Studies operates on a quarter credit system and offers courses in a variety of formats.

One quarter credit is equivalent to 0.75 semester credits.

Duration of Courses

Each full fall, winter, and spring term runs for 12 weeks. Each full summer term runs for 8 weeks.

Course durations are as follows:

- During the fall, winter, and spring terms, courses are scheduled for either 6 or 12 weeks.
- During the summer term, courses are scheduled for 4, 6, or 8 weeks.

Course Add/Drop Policy

Refer to the academic calendar (http://www.northeastern.edu/registrar/calendars.html) for specific dates.

Students may add a 4-week or 6-week course within the first week of the course. For 8- and 12-week courses, students may add a course within the first 2 weeks of the course.

Students who drop a course before the deadline will not be charged for the course and will not have a W (withdrawal) on their transcript. Thereafter, students are responsible for 100 percent of the tuition charges and applicable fees and the earned grade will be on the students' permanent academic record. All such dates are specified in the academic calendar.

Students must add/drop courses using their myNEU account.

A reduction in a student's course load could affect a student's international student visa status or financial aid eligibility.

Students who experience difficulty adding or dropping a course should promptly email (registrar@northeastern.edu) the Office of the University Registrar. If it is determined that there is an issue with the student's myNEU account or access, he or she needs to contact the Service Desk at 617.373.4357 (HELP); help@northeastern.edu.

Students with holds (e.g., financial, judicial), may have restricted access to add, drop, or withdraw from a course. In such instances, students are responsible for resolving the hold immediately and to meet the established course registration deadlines.

Course Withdrawal Policy

Refer to the academic calendar (http://www.northeastern.edu/registrar/calendars.html) for specific dates.

Students who withdraw from a course after the add/drop deadline and before the last day to withdraw will receive a W grade and will be responsible for 100 percent of the tuition charges and applicable fees. The W grade does not affect the calculation of the GPA but it does impact a student's academic progression, which may result in the student being placed on academic probation or dismissal.

Students must withdraw from courses using their myNEU account.

A reduction in a student's course load could affect a student's international student visa status or financial aid eligibility.

Students who experience difficulty withdrawing from a course should promptly contact the Service Desk at 617.373.4357 (HELP); help@northeastern.edu.

Students who fail to withdraw from a course by the deadline, regardless of their level of class participation or attendance, are financially and academically responsible. A student's lack of participation/attendance will likely result in a final grade of F.

All students are encouraged to consult with their academic advisor prior to withdrawing from a course. Withdrawals may impact a student's time to degree completion.

Student Evaluation of Courses (EvaluationKit)

Students play a critical role in the university's commitment to quality teaching and academic excellence when they participate in the evaluation of courses through EvaluationKIT, an online survey students complete anonymously at the completion of a course. Students are expected to

participate in EvaluationKIT with constructive feedback that is relevant to teaching and course content.

Students may access EvaluationKIT summary results from previous terms via their myNEU web portal (http://www.myneu.neu.edu). Courses with a response rate of less than 20 percent of enrolled students will be excluded from the results. Courses with three or fewer students enrolled are not surveyed.

Academic Progression Standards

Academic Progress/Standing

A graduate or doctoral student must maintain a minimum cumulative grade-point average (GPA) of 3.000 on a 4.000 scale to be in good academic standing. Nonmatriculated students are required to be in good academic standing to be allowed to register for any subsequent classes.

Students are responsible for reviewing their grades and academic standing at the end of each term through their myNEU account. If there are any discrepancies, students should immediately contact the instructor(s) directly. Students who want to appeal a grade have 20 working days from the date the grade is posted to do so.

Academic Probation and Dismissal

Notation of academic probation appears on a student's internal record but not on his or her permanent transcript.

Graduate (Nondoctoral) Students

With exception as specified by the program, a graduate (nondoctoral) student is placed on academic warning for low academic performance if his or her cumulative GPA is below 3.000 after he or she attempts 6 to 11 credits. At this point, the student is strongly encouraged to consult with his or her student success specialist or academic program designee to develop an action plan to improve his or her academic standing. Attempted credits include all credits/courses for which the student registered and did not drop.

A student is placed on academic probation if his or her cumulative GPA is below 3.000 after he or she attempts 12 to 17 credits. The student is required to consult with his or her student success specialist or academic program designee to develop an individualized education plan to improve his or her academic standing. Otherwise, a registration hold may be placed on the student's account.

A student whose cumulative GPA remains below 3.000 after attempting 18 or more credits will be academically dismissed. A student who has been academically dismissed from the college is automatically dismissed from his or her program of study.

A student must make consistent satisfactory academic progress toward his or her program. A student who attempts but does not complete credits and earns one or more F, I, IP, NE, or W grades for two or more consecutive terms may be placed on academic probation, which may then result in academic dismissal.

Doctoral Students

A doctoral student whose cumulative GPA is below 3.000 is placed on academic warning after attempting 3 credits; academic probation for the second time after attempting 4 to 6 credits; and academic dismissal after attempting 12 or more credits.

A doctoral student must make consistent satisfactory academic progress toward his or her program. A student who attempts but does not complete credits and earns one or more I, IP, NE, or W grades for two or more consecutive terms may be placed on academic probation, which may then result in academic dismissal.

Doctoral students should consult with their individual program areas for additional guidance with respect to academic standing.

Dismissal Notification

A student will be notified about his or her dismissal and has the right to appeal the dismissal decision to the college's academic standing committee if he or she can provide documented evidence supporting an appeal. The notification will include the appeal deadline.

Students are responsible for reviewing their grades and academic standing at the end of each term through their myNEU account.

Reinstatement after Academic Dismissal

A student who is academically dismissed from the college is not eligible to register again for courses at this college until he or she is approved for reinstatement. A student may apply for reinstatement after a minimum of one academic year if he or she can provide documented evidence supporting the application (e.g., completed two graduate courses with a grade of B or higher at another accredited college or relevant professional development opportunities during the one-plus year absence). The application must be made in writing by submitting the appropriate form and providing supporting documentation to the Office of Academic Advising (http://www.cps.neu.edu/student-resources/OAA.php).

If reinstatement to the college is approved, a student is expected to meet the most current requirements for program admissions and curriculum.

A student approved for reinstatement but who does not meet the admissions requirements for the intended program of study, or if the intended program of study is no longer available, may apply to another program.

Students reinstated must achieve good academic standing in the first term of reinstatement.

Completing Degree Requirements

Graduate and Doctoral Degree Programs

To earn a graduate or doctoral degree, students must complete all courses as prescribed in the curriculum; the required number of credits as per the curriculum; applicable thesis or dissertation; the residency requirement; and maintain a minimum cumulative grade-point average (GPA) of 3.000 or as outlined by the specific program.

Graduate Certificate Programs

To earn a graduate certificate, students must complete all courses as prescribed in the curriculum; the required number of credits as per the curriculum; the residency requirement; and maintain a minimum cumulative GPA of 3.000 or as outlined by the specific program.

Time Limit on Courses

Graduate course credits earned in the academic program or accepted by transfer are valid for a maximum of seven years.

Time Limit on Program Completion

- Graduate certificate students have up to three full years from the time of the first term of enrollment to complete the program.
- Master's degree students have up to seven full years from the time of the first term of enrollment to complete the program.

- Doctoral degree students, with the exception of the Transitional Doctor of Physical Therapy, have up to seven full years from the time of the first term of enrollment to complete the program.
- Transitional Doctor of Physical Therapy students who begin their program in the fall 2014 term or thereafter have up to four full years from the time of the first term of enrollment to complete the program.

Note: The College of Professional Studies makes adjustments to its academic program offerings and curricula to stay current and to be able to offer students the most relevant courses and knowledge in the field. Examples of such changes include adding new programs, adding/adjusting course requirements, adding/adjusting courses, and adding/adjusting curriculum requirements.

When there is a change to a curriculum or program requirement, students already matriculated and actively enrolled in the program may continue to follow the program requirements at the time of matriculation or to follow the new curriculum/program requirements, unless it is otherwise specified by the academic program at the time of the announcement of said changes.

Degrees, Majors, and Concentrations

Change of Major/Program of Study

A graduate (nondoctoral) student matriculated in a certificate/degree program who would like to enroll in a different graduate program, after consulting with their academic advisor, must apply to the intended program by submitting the following:

1. New personal statement
2. Updated resumé, if applicable
3. At least one letter of reference (for degree applicants only)

Previously awarded transfer credit awards are subject to change as a result of a program change. Students on financial aid or an international student visa are responsible for understanding the impact that results from a program change.

Doctoral students must consult with their program director or designee.

Declare a Concentration

Graduate and doctoral students matriculated in a degree program that offers concentrations must declare one concentration. This can be done at the time of application to the program as part of the admissions process. Students also may complete the appropriate form in consultation with their student success specialist or academic program designee. Students who wish to pursue a customized specialization must seek prior approval from the academic program director.

Only university-approved concentrations are noted on students' official academic records. If a student pursues a customized specialization, no concentration will be noted on his or her official academic transcript.

Students must declare a concentration by the beginning of their last term of enrollment for degree completion.

Academic Internship and Cooperative Education

An academic internship or cooperative education placement is an opportunity for students to engage in a short-term workplace experience that is relevant to their academic course of study. The College of Professional Studies' Department of Cooperative Education (http://www.cps.neu.edu/coop) makes every effort to work with students to identify experiential learning opportunities of three to six months to facilitate career exploration and transition. This program is an optional component of most degree programs. Students must qualify to participate. Review the website (http://www.cps.neu.edu/coop) for guidelines, academic requirements, and opportunities.

Seeking more than One Certificate or Degree

A graduate (nondoctoral) student can be enrolled in only one graduate program at a time.

Graduate (nondoctoral) students seeking more than one certificate or degree after having completed a program should note that graduate credits earned toward:

1. A degree at any institution may not be used to satisfy the requirements of another graduate program.
2. A degree earned at the College of Professional Studies may be used to satisfy the requirements of a graduate certificate with a cap of 50 percent of the required credits of a graduate certificate, if the contents are determined to be applicable per the program director and if the credits were earned within seven years of pursuit of the certificate.
    a. If the same course is required in the degree and certificate programs and the student has exceeded the maximum number of credits that can be applied in the certificate program, he or she may request a course waiver to be permitted to take another course instead of repeating the course. See Course Waiver section.
3. With specified exception, a certificate earned at the College of Professional Studies may be used to satisfy the requirements of a graduate degree, if the contents are determined to be applicable per the program director and if the credits were earned within seven years of pursuit of the degree.
4. A certificate earned at the College of Professional Studies may be used to satisfy the requirements of a second certificate with a cap of one course of no more than 4 credits, if the contents are determined to be applicable per the program director and if the credits were earned within seven years of pursuit of the certificate.
    a. If the same course is required in both certificate programs and the student has exceeded the maximum number of credits that can be applied in the second certificate program, he or she will request a course waiver to be permitted to take another course instead of repeating the course. See Course Waiver section.
5. A certificate earned at another accredited institution may be accepted as transfer credits to satisfy the requirements of a graduate degree with a cap of two courses (no more than 12 credits), if the contents are determined to be applicable per the program director and if the credits were earned within seven years of pursuit of the degree.

A graduate (nondoctoral) degree student who wishes to pursue a graduate certificate concurrently may seek admission in the certificate program by the end of his or her first term of matriculation in the degree program. Courses that satisfy requirements for both the degree and certificate will count for each.

- When the certificate is identical to a concentration in a degree program, only the certificate credential will be earned. The student's transcript will not indicate completion of a concentration

A doctoral student can be enrolled in only one program at a time and may not seek an additional certificate or degree.

Graduation Requirements

Graduation Procedures

The following information is for degree-seeking students only. Certificate students should refer to the "Certificate" section, below.

Only students who complete the graduation application process by specified deadlines will be considered for graduation and included in the graduation ceremony program. All qualified students must submit a graduation application in order to receive their diploma, regardless of whether they plan to attend the graduation ceremony.

Note important definitions: "Degree conferral date" and "graduation ceremony date" do not mean the same thing. Degree conferral date refers to the date of the university's official recognition of degree completion. For the purposes of the graduation application, that is accessed via a student's myNEU account. The "expected graduation date" (EGD) is the same as the degree conferral date. Northeastern University confers degrees four times each academic year: winter, spring, summer, and fall. The graduation ceremony date is the date that the college hosts the annual graduation ceremony.

To qualify for winter degree conferral, a student must satisfy all degree requirements by the end of the previous fall quarter. To qualify for spring degree conferral, a student must satisfy all degree requirements by the end of the previous winter quarter. To qualify for summer degree conferral, a student must satisfy all degree requirements by the end of the previous spring quarter. To qualify for fall degree conferral, a student must satisfy all degree requirements by the end of the previous summer quarter.

Doctoral candidates must be mindful of additional deadlines to complete their dissertation/thesis in time to be eligible for degree conferral and participation in a doctoral hooding and a graduation ceremony.

Each fall, the Office of the Registrar sends an email notification to students who may be eligible to graduate that academic year about applying to graduate. Eligibility is based on the number of earned credits at the beginning of the fall term. This email notification informs and instructs students to complete the "Apply to Graduate" process, accessed via their myNEU account. Students are prompted to verify and provide critical information, e.g., spelling of the student's name on the diploma, intent to participate in the graduation ceremony, and mailing address.

An accurate EGD is required to gain access to the graduation application. The EGD is also used by clearinghouses to determine loan deferment schedules. If your EGD is not correct, contact your designated student success specialist.

For more information, visit the College of Professional Studies Graduation web page (http://www.cps.neu.edu/student-resources/graduation).

Diploma

The following rules apply to the diploma.

- Information that will be printed on diplomas:
  - Major for only nonspecified degrees (Master of Arts, Master of Science).
- Changes made to a student's name after the diploma has been printed may be subject to a $50 fee and take more than one month to reprint.
- Changes made to a student's degree information and name submitted after the program deadline will not be noted in the graduation ceremony program. If a diploma was previously printed, it will need to be reprinted and can take more than one month.

Certificate

The College of Professional Studies confers graduate certificates the same time degrees are conferred each year: winter, spring, fall, and summer. Students must submit the appropriate form to their career and academic coach in order to have their academic record audited to receive their certificate. Deadlines apply. All certificates will be mailed to the address provided on the form.

Global Partnership Programs

Students enrolled in a College of Professional Studies' global partnership or a dual-degree program are required to abide by the policies and procedures of both institutions or as specified in their program.

Dual-degree candidates must apply to graduate at each institution by following each institution's policies and procedures.

Accommodations for Students with Disabilities

Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) to participate fully in the activities of the university. To receive accommodations through the DRC, students must provide appropriate documentation that demonstrates a current substantially limiting disability. Accommodations are provided based on an evaluation of the information provided by students and their clinicians, on a case-by-case basis. These services are available for, but not limited to, students with the following diagnoses:

- Learning disabilities and/or AD(H)D
- Autism spectrum disorders
- Chronic or degenerative disorders
- Hearing loss
- Mobility impairments
- Psychiatric disorders
- Traumatic or acquired brain injury
- Vision impairments

Students should provide documentation to the DRC at their earliest convenience to allow for sufficient time for review. After the documentation has been reviewed, a disability specialist will contact the student regarding appropriate next steps. Visit the DRC website (http://www.northeastern.edu/drc) for additional information or contact staff at 617.373.2675.

Personal Information

Change of Name

Report all name changes to the Office of the Registrar immediately. This is especially important when students marry and wish to use a new name on university records. Official documentation of the name change is required.

Change of Address

Report all address changes via the myNEU web portal (http://myneu.neu.edu) or in person at the Office of the Registrar or Office of Student Accounts. Both the permanent home address and the local address are required. International students must also report any changes of address to the International Student and Scholar Institute (ISSI) within 10 days in order to ensure compliance with Student and Exchange Visitor Information System (SEVIS) requirements.

Graduate Campus

Students enrolled in a Northeastern University graduate (regional) campus are also required to abide by the policies and procedures specific to that campus.

Doctoral Degree Programs

Guided by industry leading faculty, our innovative **doctoral programs** combine cutting-edge course work with professionally relevant research projects. These programs will provide you with the opportunity to earn the policy, research, and administrative foundation necessary to advance to the top of your career.

Programs

Doctor of Education (EDD)

- Education (p. 282)

Doctor of Law and Policy (DLP)

- Law And Policy (p. 284)

Transitional Doctor of Physical Therapy (DPT)

- Physical Therapy (p. 285)
- Physical Therapy—Direct Entry (p. 285)

Education, EDD

The Doctor of Education (EdD) program offers a rich, dynamic learning experience—one that blends critical engagement with theory, practice, and research.

Offering innovative and engaging opportunities, our EdD seeks to further cultivate the skills and knowledge necessary to effect meaningful change in your organization. As a Doctor of Education student, you have an opportunity to collaborate with an accomplished group of fellow practitioners, exposing you to global perspectives and strengthening your ability to think critically about today's educational challenges.

Built on Northeastern University's scholar-practitioner model, the EdD program integrates your professional experience with doctoral-level research, which should enable you to identify and address your practice-based issues while investigating matters of social justice. Through rigorous course work and collaborative experiences, you have an opportunity to conduct empirical research culminating in a doctoral thesis that examines a compelling educational challenge.

Admission Requirements

Note that all Doctor of Education degrees offered through the College of Professional Studies have the following admission requirements:

- Online application
- Academic transcripts (undergraduate **and** graduate)
- Admissions statement (1,000–1,200 words)
- Minimum of three years of professional work experience in a related field
- Professional resumé
- Faculty recommendation
- Two professional recommendations
- English-language proficiency proof (for non-native English-language speakers)

Curriculum, Teaching, Learning, and Leadership Concentration

The Doctor of Education with Concentration in Curriculum, Teaching, Learning, and Leadership helps educational leaders develop the competencies, dispositions, and values required to pursue educational reform, based on a commitment to social justice. Students explore the relationship between effective educational leadership and the ways that curriculum and teaching can enhance learning opportunities for students across their life span.

This EdD concentration focuses on preparing transformational leaders who recognize the importance of providing quality educational experiences for all learners.

Key learning objectives include how to:

- Assess how issues of social justice play out in contemporary educational settings
- Analyze education systems to gain an understanding of the evolution of micro- and macrolevel policies and legislation
- Examine international curriculum and instruction research and practices
- Investigate the development and interaction of leadership roles within organizations
- Explore the theoretical and historical dimensions of curriculum, teaching, and learning in varied educational settings

Higher Education Administration Concentration

The Doctor of Education with Concentration in Higher Education Administration includes the study of practice and scholarship within all sectors of postsecondary education including community colleges, four-year colleges, for-profit institutions, and research universities. The increased globalization of higher education is addressed throughout the program. The concentration allows experienced educators and administrators to reflect on and advance their knowledge in ways that will enhance their ability to make a contribution to higher education and further their careers.

This concentration offers students an opportunity to conduct research that addresses critical issues in higher education. This concentration seeks to produce graduates well-grounded in the educational roles and critical issues in colleges and universities, including:

- Cultural, ethical, and societal issues in higher education
- Historical considerations in higher education around the world
- Organization, governance, leadership, and administrative theories
- Higher education finance, law, and planning
- Establishing and sustaining initiatives in higher education

Organizational Leadership Studies Concentration

The Doctor of Education with Concentration in Organizational Leadership Studies positions experienced leaders to assume greater responsibilities within their organizations. Designed for leaders working in educational, government, healthcare, military, not-for-profit, for-profit, and management consulting organizations, this concentration combines theory, research, and practice to develop individuals who can effectively manage and lead change in today's fast-paced, global environment.

The interdisciplinary curriculum offers a strong foundation in leadership, culture, learning, change, communications, systems, and strategy. Students have an opportunity to conduct and apply doctoral research to develop real-world answers to the leadership challenges facing 21st-century organizations.

Throughout the course of the program, students have an opportunity to:

- Review contemporary leadership theory and models emphasizing recent conceptualizations such as adaptive, relational, distributed, complexity, and global leadership to refine their personal leadership knowledge, skills, and abilities
- Examine key models of organizational culture to build their own capability to understand and interact with different societal and organizational cultures across the world
- Enhance their ability to think systemically by developing the required competencies to create cultures and structuring processes for learning in their organizations
- Explore classical and modern theories of organization and design a forward-thinking organization creating all components, including vision, mission, strategy, structure, and processes
- Use both seminal and current theoretical approaches of organizational communication to investigate the dynamic interplay between communication processes and human organizing
- Examine seminal and modern group dynamics research to assess group processes and to stimulate group development inside their organizations
- Investigate topical consulting strategies and organizational assessment tools and conduct an organizational diagnosis to gain a comprehensive understanding of the models, variables, and perspectives used to understand complex organizational processes
- Integrate organizational power theory, research, and practical diagnostic tools to systematically identify and evaluate the political processes and behaviors at play inside their organizations

This program seeks to produce graduates who have the capacity to contribute new knowledge to leadership scholarship and become positive forces of change.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Note: A minimum of 51 quarter hours must be taken at the College of Professional Studies.

Required Foundation Courses

EDU 7209	Introduction to Doctoral Studies	3
EDU 7214	Changing Conceptions of Learning and Human Development: Research and Practice	3
EDU 7202	Transforming Human Systems	3
EDU 7210	Leadership Theory and Research	3

Required Research Courses

Research Courses		
EDU 7280	Fundamentals of Research	3
EDU 7281	Research Design	3
Proposal Development		
Complete one of the following:		3
EDU 7282	Quantitative Research	
EDU 7283	Qualitative Research	

Concentration

Complete one of the following three concentrations:

Concentration in Curriculum, Teaching, Learning, and Leadership		
EDU 7216	Social Justice and Educational Equity	3
EDU 7217	Educational Systems: The Dynamics between Policy, Values, and Practice	3
EDU 7213	Education Entrepreneurship	3
EDU 7242	Situated Leadership	3
EDU 7244	Curriculum Theory and Practice Over Time: Implications for Educational Leadership	3
Elective Courses		
Complete 12 quarter hours in the following range:		
EDU 7000 to EDU 7999		
Doctoral Thesis Courses		
EDU 8796	Thesis Proposal and the Internal Review Board	0
EDU 8797	Thesis Data Collection, Initial Analysis, and Management	0
EDU 8798	Thesis Data Analysis and Presentation	0
EDU 8799	Thesis Findings and Discussion	12

Concentration in Higher Education Administration		
Complete the following five courses for the higher education concentration (15 quarter hours):		
EDU 7204	Global and Historical Perspectives on Higher Education	3
EDU 7250	Organizational Systems and Institutional Governance	3
EDU 7253	The Legal Environment of Higher Education	3
EDU 7256	Financial Decision Making in Higher Education	3
EDU 7258	Strategic Management in Higher Education	3
Complete the following courses for the international higher education track within the higher education concentration (15 quarter hours):		
EDU 7204	Global and Historical Perspectives on Higher Education	3
EDU 7250	Organizational Systems and Institutional Governance	3
EDU 7253	The Legal Environment of Higher Education	3
Complete two of the following courses. You may also take more than two of the following courses as elective offerings:		

EDU 7260	Comparative International/Global Higher Education	3
EDU 7261	International Student Markets	3
EDU 7264	Educating Global Students: Issues and Practices	3
Elective Courses		
Complete 12 quarter hours in the following range:		
EDU 7000 to EDU 7999		
Doctoral Thesis Courses		
EDU 8796	Thesis Proposal and the Internal Review Board	0
EDU 8797	Thesis Data Collection, Initial Analysis, and Management	0
EDU 8798	Thesis Data Analysis and Presentation	0
EDU 8799	Thesis Findings and Discussion	12

Concentration in Organizational Leadership Studies

Complete the following five courses for the organizational leadership studies concentration (15 quarter hours):		
EDU 7278	Organization Theory and Design	3
EDU 7277	Organizational Learning and Systems Thinking	3
EDU 7272	Global Perspectives of Organizational Culture	3
EDU 7276	Organizational Communication: Institutional and Global Perspectives	3
EDU 7275	Contemporary Models of Leadership	3
Complete the following courses for the sports leadership track within the organizational leadership studies concentration (15 quarter hours):		
EDU 7278	Organization Theory and Design	3
EDU 7277	Organizational Learning and Systems Thinking	3
EDU 7272	Global Perspectives of Organizational Culture	3
EDU 7276	Organizational Communication: Institutional and Global Perspectives	3
EDU 7290	Contemporary Models of Sports Leadership	3
EDU 7291	Personnel Development in Sports Leadership	3
Complete the following two sports leadership courses to satisfy 6 quarter hours of your 12-quarter-hour elective requirement:		
EDU 7292	Social Justice in Sports	3
EDU 7293	Legal and Ethical Issues in Sports Leadership	3
Elective Courses		
Complete 12 quarter hours in the following range:		
EDU 7000 to EDU 7999		
Doctoral Thesis Courses		
EDU 8796	Thesis Proposal and the Internal Review Board	0
EDU 8797	Thesis Data Collection, Initial Analysis, and Management	0
EDU 8798	Thesis Data Analysis and Presentation	0
EDU 8799	Thesis Findings and Discussion	12

Program Credit/GPA Requirements

60 total quarter hours required
Minimum 3.000 GPA required

Law And Policy, DLP

Public servants, executives, and managers operate in an increasingly complex global environment. A doctoral education seeks to provide the policy, analytic, and research skills necessary to advance one's career.

Developed jointly by the College of Professional Studies and Northeastern's Law and Public Policy program, the Doctor of Law and Policy program (DLP) is designed for experienced professionals who are interested in the origins, development, implementation, and analysis of legal and public policy decisions in government and related institutions. The program prepares students to advance their careers within a variety of fields while focusing their thesis research on a precise law and policy topic.

Students undertake the DLP in order to understand the ways in which public and related institutions formulate and execute policy. Students have the opportunity to develop the ability to interpret and assess the research of others, to acquire skills as researchers, and to communicate their knowledge to a wide range of audiences. Those who successfully complete the degree are equipped to bring their skills and knowledge to senior policy and management positions in government, nonprofit agencies, research organizations, consulting firms, and corporations.

The DLP program is structured so course work and the doctoral thesis can be completed in two years. Classes meet one weekend per month in Boston, and the learning continues online throughout the rest of the month.

Northeastern University also offers a traditional PhD in Law, Policy, and Society. To learn more, visit the law and public policy program website (http://www.northeastern.edu/cssh/policyschool/law-public-policy-phd).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

LWP 6120	Law and Legal Reasoning 1	2
LWP 6401	Law and Policy Concepts 1: The Policy Making Process	2
LWP 6424	Research Methods	2
LWP 6121	Law and Legal Reasoning 2	2
LWP 6402	Law and Policy Concepts 2: Strategizing for Public Policy	2
LWP 6423	Qualitative Methods	2
LWP 6122	Law and Legal Reasoning 3	2
LWP 6403	Law and Policy Concepts 3: Policy Case Studies	2
LWP 6420	Quantitative Methods	2
LWP 6123	Law and Legal Reasoning 4	2
LWP 6410	Economics for Policy Analysis	2
LWP 6404	Evaluation Research	2
LWP 6431	Political and Moral Ethics and Dilemmas	2

LWP 6425	Methods and Theory as Applied to Doctoral Research	2
LWP 6500	Doctoral Research Design 1	2
LWP 6450	Public Policy Theory and Practice 1	4
LWP 6501	Doctoral Research Design 2	2
LWP 6451	Public Policy Theory and Practice 2	4
LWP 6502	Doctoral Research Design 3	2
LWP 6452	Public Policy Theory and Practice 3	4
LWP 6503	Doctoral Research Design 4	2

Program Credit/GPA Requirements

48 total quarter hours required
Minimum 3.000 GPA required

Transitional Doctor of Physical Therapy, DPT

Designed for practicing physical therapists, the transitional Doctor of Physical Therapy (DPT) is an innovative, 100 percent online program. Integrating art and science, as well as professional and experiential learning, this curriculum seeks to provide you with the necessary knowledge base for today's practitioners with an earned doctoral degree.

Core courses within this physical therapy doctoral program include differential diagnosis and medical screening, diagnostic imaging, pharmacology, nutrition, and motor control. The capstone course, Comprehensive Case Analysis (PTH 6900), is a culmination of all work within the transitional DPT curriculum. Students have an opportunity to prepare a comprehensive and publishable case report or other scholarly work in partial fulfillment of the requirement for a transitional DPT degree.

The transitional DPT also includes specializations in a variety of areas such as orthopaedics, pediatrics, geriatrics, advanced nutrition, women's health, education, and business management. If you have a unique specialization interest, you may also complete a directed study on a preapproved topic of your choosing.

Credit Requirement

The transitional DPT degree is built upon a core of six courses. Beyond the common core, requirements may vary depending on whether the physical therapist is MSPT or BSPT prepared in addition to the student's past experiences.

For students entering with a Master of Science in Physical Therapy, 26 quarter hours are required.

Residents of the state of North Carolina must have an earned master's degree to be eligible for admission to the transitional Doctor of Physical Therapy program.

For students entering with a Bachelor of Science in Physical Therapy, 35 quarter hours are required.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Note: 26 quarter hours are required for students entering with a Master of Science in Physical Therapy.

Required Courses for All Students

PTH 6100	Differential Diagnosis and Medical Screening	4
PTH 6110	Diagnostic Imaging	4
PTH 6130	Pharmacology	3
PTH 6900	Comprehensive Case Analysis	4
PTH 6140	Motor Control	4

Required Nutrition Course

Complete one of the following: 3-4

PTH 6120	Clinical Nutrition
NTR 6120	Healthy Aging: Nutrition Strategies for Optimal Longevity
NTR 6119	Pediatric Nutrition
NTR 7147	Sports and Fitness Nutrition

Elective Course

Complete one of the following: 4-5

PTH 6430	Educational Strategies for Effective Healthcare Delivery
PTH 6400	Orthopedics: Shoulder
PTH 6480	Evidence-Based Exercise for the Older Adult
PTH 6490	Pediatric Physical Therapy: Emerging Topics and Evidence-Based Practice
PTH 6985	Psychosocial and Emotional Challenges Facing Older Adults
PTH 6200	Research Methods and Statistical Analysis
PTH 6235	Administrative and Management Keys for Contemporary Physical Therapist Practice
PTH 6220	Fostering Change in Health Behavior
PTH 6561	Evidence-Based Examination and Outcomes for the Cervical-Thoracic Spine and Temporomandibular Joint
PTH 6562	Evidence-Based Examination and Outcomes for Upper Extremity: Shoulder, Elbow, and Hand
PTH 6563	Evidence-Based Examination and Outcomes for Lumbar Spine and Sacroiliac Joint
PTH 6564	Evidence-Based Examination and Outcomes for Lower Extremity: Hip, Knee, Foot, and Ankle

Program Credit/GPA Requirements

26 total quarter hours required
Minimum 3.000 GPA required

Transitional Doctor of Physical Therapy, DPT—Direct Entry

Designed for practicing physical therapists, the **transitional Doctor of Physical Therapy (DPT) is an innovative, 100 percent online program.** Integrating art and science, as well as professional and experiential education, the degree curriculum provides you with the necessary knowledge base for today's doctorally prepared practitioners.

Core courses within this physical therapy doctoral program include differential diagnosis and medical screening, diagnostic imaging, pharmacology, nutrition, and motor control. The capstone course, Comprehensive Case Analysis (PTH 6900) , is a culmination of all

work within the transitional DPT curriculum. Students will prepare a comprehensive and publishable case report or other scholarly work in partial fulfillment of the requirement for a transitional Doctor of Physical Therapy Degree.

The transitional Doctor of Physical Therapy also includes concentrations in a variety of areas such as orthopaedics, pediatrics, geriatrics, advanced nutrition, women's health, education, and business management. If you have a unique concentration interest, you may also complete a directed study on a preapproved topic of your choosing.

Note: Degree requirements differ for North Carolina students. For more information, visit the Northeastern University—Charlotte website (http://www.northeastern.edu/charlotte/find-a-degree-program/healthcare/transitional-doctor-of-physical).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

*Note: 3*5 quarter hours are required for students entering with a Bachelor of Science in Physical Therapy.

Required Courses for all Students

PTH 6100	Differential Diagnosis and Medical Screening	4
PTH 6110	Diagnostic Imaging	4
PTH 6130	Pharmacology	3
PTH 6900	Comprehensive Case Analysis	4
PTH 6140	Motor Control	4
PTH 6200	Research Methods and Statistical Analysis	5

Required Nutrition Course

Complete one of the following:		3-4
PTH 6120	Clinical Nutrition	
NTR 6120	Healthy Aging: Nutrition Strategies for Optimal Longevity	
NTR 6119	Pediatric Nutrition	
NTR 7147	Sports and Fitness Nutrition	

Additional Required Elective for BS Entry Students

Complete one of the following:		4
PTH 6235	Administrative and Management Keys for Contemporary Physical Therapist Practice	
PTH 6220	Fostering Change in Health Behavior	
PTH 6430	Educational Strategies for Effective Healthcare Delivery	

Elective Course

Complete one of the following:		4-5
PTH 6430	Educational Strategies for Effective Healthcare Delivery	
PTH 6400	Orthopedics: Shoulder	
PTH 6480	Evidence-Based Exercise for the Older Adult	
PTH 6490	Pediatric Physical Therapy: Emerging Topics and Evidence-Based Practice	
PTH 6985	Psychosocial and Emotional Challenges Facing Older Adults	
PTH 6200	Research Methods and Statistical Analysis	
PTH 6235	Administrative and Management Keys for Contemporary Physical Therapist Practice	
PTH 6220	Fostering Change in Health Behavior	
PTH 6561	Evidence-Based Examination and Outcomes for the Cervical-Thoracic Spine and Temporomandibular Joint	
PTH 6562	Evidence-Based Examination and Outcomes for Upper Extremity: Shoulder, Elbow, and Hand	
PTH 6563	Evidence-Based Examination and Outcomes for Lumbar Spine and Sacroiliac Joint	
PTH 6564	Evidence-Based Examination and Outcomes for Lower Extremity: Hip, Knee, Foot, and Ankle	

Program Credit/GPA Requirements

35 total quarter hours required
Minimum 3.000 GPA required

Master's Degree Programs

Representing in-demand fields such as education, technology, project management, and regulatory affairs, our **master's degree programs** are grounded in theory and applied in practice. Programs may be taken part-time or full-time, online, or on campus, providing you maximum flexibility and convenience for your busy schedule.

Programs

Master of Arts (MA)

- Homeland Security (p. 287)

Master of Arts in Teaching (MAT)

- Teaching, Elementary Licensure (p. 288)
- Teaching, Secondary Licensure (p. 289)

Master of Education (MEd)

- Education (p. 290)

Master of Professional Studies (MPS)

- Analytics (p. 292)
- Digital Media (p. 293)
- Digital Media (p. 294)—ALIGN Program (p. 93)
- Geospatial Services (p. 295)
- Informatics (p. 296)

Master of Science (MS)

- Applied Nutrition (p. 298)
- Commerce and Economic Development (p. 298)
- Corporate and Organizational Communication (p. 299)
- Criminal Justice (p. 301)
- Global Studies and International Relations (p. 304)
- Human Services (p. 307)
- Leadership (p. 308)

- Nonprofit Management (p. 309)
- Program and Portfolio Project Management (p. 310)
- Project Management (p. 311)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Clinical Research Regulatory Affairs (p. 313)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in General Regulatory Affairs (p. 314)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in International Regulatory Affairs (p. 315)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Operational Regulatory Affairs (p. 316)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Regulatory Compliance (p. 317)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Strategic Regulatory Affairs (p. 318)
- Regulatory Affairs of Food and Food Industries (p. 319)
- Respiratory Care Leadership (p. 319)
- Technical Communication (p. 320)

Master of Sports Leadership (MSLD)

- Sports Leadership (p. 321)

Homeland Security, MA

The Master of Arts in Homeland Security is intended to prepare the next generation of emergency managers and homeland security professionals for leadership roles in the public and private sectors. The degree offers a comprehensive program of studies covering core elements of homeland security and emergency management at the graduate level, including management skills, intelligence gathering and analysis, risk management, emergency planning and management, legal issues, technological issues, and social psychology. The master's in homeland security program is designed to develop high-level operational expertise through the application of the above content to the implementation of emergency response protocols as executed in the United States.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

HLS 6000	Introduction to Homeland Security	3
HLS 6010	The Unconventional Threat to Homeland Security	3
HLS 6020	Technology for Homeland Security	3
HLS 6030	Intelligence for Homeland Security	3
HLS 6040	Critical Infrastructure: Vulnerability Analysis and Protection	3
HLS 6050	Multidisciplinary Approaches to Homeland Security	3
CMN 6050	Crisis Communication	3

Elective Courses

Complete two of the following: 6-8

HLS 6035	Advanced Intelligence Applications for Homeland Security
HLS 6983	Topics in Homeland Security
CJS 6015	Crisis Management
CJS 6125	Issues in National Security
CJS 6000	Management for Security Professionals
CJS 6010	Advanced Principles of Security Management and Threat Assessment
CJS 6005	Legal and Regulatory Issues for Security Management
CJS 6430	Risk Management
GST 6720	Emerging Infectious Diseases and Health Impacts of Social and Environmental Changes
GST 6300	Security and Terrorism
CMN 6060	Negotiation, Mediation, and Facilitation
CJS 6964	Co-op
INT 6943	Integrative Experiential Learning
CJS 5978	Independent Study

Concentration

Complete one of the following concentrations:

Concentration in Emergency Management

HLS 6070	Emergency Management and Geographic Information Systems	3
HLS 6060	Strategic Planning and Budgeting	3
HLS 6080	Continuity of Operations and Planning	3
GIS 5101	Introduction to Geographic Information Systems	3
GIS 5102	Fundamentals of GIS Analysis	3
GIS 6394	Crisis Mapping for Humanitarian Action	3

Concentration in Organization and Infrastructure Continuity

CJS 6430	Risk Management	3
HLS 6090	Organization and Structural Continuity Planning	3
GIS 5101	Introduction to Geographic Information Systems	3
GIS 5102	Fundamentals of GIS Analysis	3
ITC 6315	Information Security Risk Management	3
ITC 6310	Information Security Governance	3

Concentration in Port Security

Students selecting this concentration are only required to take 4 quarter hours of electives:		
HLS 6100	Maritime and Port Security 1	4
HLS 6110	Maritime and Port Security 2	4
HLS 6120	Aviation Security 1	4
HLS 6130	Aviation Security 2	4
HLS 6140	Port Security Capstone	4

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Teaching, Elementary Licensure, MAT

Designed for aspiring teachers and career changers, the Master of Arts in Teaching in Elementary Education (MAT)[1] offers an appreciation for and an understanding of the diverse educational needs, social concerns, and cultural values of today's elementary and secondary schools. This graduate degree in teaching seeks to enhance your foundational skills, broaden your perspectives, and strengthen your ability to inspire and educate. The master's degree, which includes a full term of student teaching, seeks to produce graduates well positioned to make a meaningful impact in their school, in their community, and in the lives of their students.

[1] The MAT (grades 1–6) has been approved at the initial licensure level by the Massachusetts Department of Elementary and Secondary Education.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

EDU 6051	Culture, Equity, Power, and Influence	4
EDU 6086	Foundations of Literacy Development and Instruction	4
EDU 6104	Child and Adolescent Development, Learning, and Teaching	4
EDU 6107	Inclusion, Equity, and Diversity	4
EDU 6154	Inquiry in the Sciences and Humanities	4
EDU 6155	Inquiry in Mathematics	4
EDU 6185	English-Language Learners in the General Education Classroom	4
EDU 6183	Collaborative Strategies for Effective Classroom Management	1
EDU 6866	Teaching Practicum and Seminar	1-8

Elective Courses

Complete 8 quarter hours from the following: 8

EDU 6023	Institute in Creating a Community of Learners/Behaviors	
EDU 6300	Introduction to Language and Linguistics	
EDU 6425	Special Education: Role of Special Educators in an Inclusive School	
EDU 6426	Developmental Language, Literacy, and Writing: Assessment and Instruction	
EDU 6429	Variations in Child and Adolescent Development	
EDU 6436	Best Practices for the 21st-Century Education	
EDU 6437	Assessment in Education	
EDU 6438	Teachers as Curriculum Leaders	
EDU 6452	Critical Scholarly Investigation: On Location	
EDU 6462	Children's Literature	
EDU 6465	Critical and Creative Thinking	
EDU 6472	Advanced Special Education Strategies	
EDU 6516	Sheltered English Instruction and Assessment	
EDU 6520	Learning and the Brain: Translating Research into Practice	
EDU 6528	Adaptive Learning/Behavior Management Strategies: Consultation and Collaboration	
EDU 6530	Beyond Behavior Management	
EDU 6569	Differentiated Instruction and Assessment in Mathematics	
EDU 6570	Advanced Strategies in Literacy: Readers and Writers Who Struggle	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

LOOKING TO DEEPEN YOUR KNOWLEDGE AND EXPERTISE?

The MAT+ offers qualifying students the opportunity to complete a MAT with further study in a selected area of expertise. Currently, students can take additional course work to earn either an additional license in special education (teacher of students of moderate disabilities, PreK–8 or 5–12).

MAT+ IN SPECIAL EDUCATION

The MAT+ provides qualifying students with the opportunity to complete a Master of Arts in Teaching (MAT) with further study in a selected area of expertise. Currently, students can take additional course work to earn either an additional license in special education (teacher of students of moderate disabilities, PreK-8 or 5-12) or an additional license in ESL (teacher of English as a Second Language, PreK-8 or 5-12). Teacher candidates may also plan a program of study that allows for triple licensure in consultation with the program director.

The special education course requirements are:

Advanced special education course		4
Advanced literacy course		4
Advanced behavior management course		4
Assessment course		4
EDU 6874	Practicum, Portfolio, and Panel Review	4

MAT+ IN ENGLISH AS A SECOND LANGUAGE (ESL)

This Commonwealth of Massachusetts-approved MAT+ program consists of five courses, some of which may be taken as electives in the MAT program.

The English as a Second Language course requirements are:

EDU 6300	Introduction to Language and Linguistics	4
EDU 6516	Sheltered English Instruction and Assessment	4
EDU 6517	Foundations of Teaching English as a Second Language: Research and Practice	4
EDU 6310	Literacy Development and the Academic Domains	4
EDU 6874	Practicum, Portfolio, and Panel Review	4

Teaching, Secondary Licensure, MAT

Designed for aspiring teachers and career changers, the Master of Arts in Secondary Education (MAT)[1] offers an appreciation for and an understanding of the diverse educational needs, social concerns, and cultural values of today's secondary schools.

This MAT in secondary education seeks to enhance your foundational skills, broaden your perspectives, and strengthen your ability to inspire and educate. This master's degree, which includes a full term of student teaching, seeks to produce graduates well positioned to make a meaningful impact in their school, in their community, and in the lives of their students.

- Gain political, social, and historical perspectives on education
- Explore the richly complex environments of schools and communities
- Develop a working understanding of teaching and learning in diverse settings
- Investigate how humans learn, acquire knowledge, and make sense of their experiences
- Examine theories of teaching and explore how best to teach for understanding and learning achievement
- Research methods and materials, pedagogies, and assessment strategies that foster integrated learning

[1] The Master of Arts in Secondary Education (grades 8–12) has been approved at the initial licensure level by the Massachusetts Department of Elementary and Secondary Education.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

EDU 6051	Culture, Equity, Power, and Influence	4
EDU 6064	Curriculum and Assessment	4
EDU 6104	Child and Adolescent Development, Learning, and Teaching	4
EDU 6107	Inclusion, Equity, and Diversity	4
EDU 6162	Language, Culture, and Literacy in Middle and High Schools	4
EDU 6185	English-Language Learners in the General Education Classroom	4
EDU 6183	Collaborative Strategies for Effective Classroom Management	1
EDU 6866	Teaching Practicum and Seminar	1-8

Elective Courses

Complete 8 quarter hours from the following:		8
EDU 6023	Institute in Creating a Community of Learners/Behaviors	
EDU 6300	Introduction to Language and Linguistics	
EDU 6425	Special Education: Role of Special Educators in an Inclusive School	
EDU 6426	Developmental Language, Literacy, and Writing: Assessment and Instruction	
EDU 6429	Variations in Child and Adolescent Development	
EDU 6436	Best Practices for the 21st-Century Education	
EDU 6437	Assessment in Education	
EDU 6438	Teachers as Curriculum Leaders	
EDU 6452	Critical Scholarly Investigation: On Location	
EDU 6462	Children's Literature	
EDU 6465	Critical and Creative Thinking	
EDU 6472	Advanced Special Education Strategies	
EDU 6516	Sheltered English Instruction and Assessment	
EDU 6520	Learning and the Brain: Translating Research into Practice	
EDU 6528	Adaptive Learning/Behavior Management Strategies: Consultation and Collaboration	
EDU 6530	Beyond Behavior Management	
EDU 6569	Differentiated Instruction and Assessment in Mathematics	
EDU 6570	Advanced Strategies in Literacy: Readers and Writers Who Struggle	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

LOOKING TO DEEPEN YOUR KNOWLEDGE AND EXPERTISE?

The MAT+ offers qualifying students the opportunity to complete a MAT with further study in a selected area of expertise. Currently, students can take additional course work to earn either an additional license in special education (teacher of students of moderate disabilities, PreK–8 or 5–12) or an additional license in ESL (teacher of English as a Second Language, PreK-8 or 5-12).

MAT+ IN SPECIAL EDUCATION

The MAT+ provides qualifying students with the opportunity to complete a Master of Arts in Teaching (MAT) with further study in a selected area of expertise. Currently, students can take additional course work to earn either an additional license in special education (teacher of students of moderate disabilities, PreK-8 or 5-12) or an additional license in ESL (teacher of English as a Second Language, PreK-8 or 5-12). Teacher candidates may also plan a program of study that allows for triple licensure in consultation with the program director.

The special education course requirements are:

Advanced special education course		4
Advanced literacy course		4
Advanced behavior management course		4
Assessment course		4
EDU 6874	Practicum, Portfolio, and Panel Review	4

MAT+ IN ENGLISH AS A SECOND LANGUAGE (ESL)

This Commonwealth of Massachusetts-approved MAT+ program consists of five courses, some of which may be taken as electives in the MAT program.

The English as a Second Language course requirements are:

EDU 6300	Introduction to Language and Linguistics	4

EDU 6516	Sheltered English Instruction and Assessment	4
EDU 6517	Foundations of Teaching English as a Second Language: Research and Practice	4
EDU 6310	Literacy Development and the Academic Domains	4
EDU 6874	Practicum, Portfolio, and Panel Review	4

Education, MEd

eLearning and Instructional Design Concentration

Recent research on the science of learning has revolutionized our understanding of how people learn. As technology has become ubiquitous in society, learning takes place in many venues and formats: face-to-face, blended, online, and mobile. Seismic shifts are taking place in the education sector, such as competency-based learning and open education. These developments are creating a growing demand for professionals who can help their organizations think strategically about approaches to learning that are pedagogically sound and technology-savvy.

The elearning and instructional design concentration explores the leading edge of next-generation learning design, with the goal of preparing its graduates to thrive in a world of expanded opportunities and delivery modes for learning. The concentration's innovative approach blends academic and experiential workplace-based learning. During the course of study, students develop an online portfolio of work to demonstrate their capacity to think strategically, put creative ideas into action, and design environments that improve student learning to meet academic, personal, institutional, and organizational goals.

Higher Education Administration Concentration

Due to advances in elearning and increasing student enrollments, the need for capable and effective school administrators has never been greater. In addition to providing solid guidance and direction, they must work to meet the needs of faculty, students, and parents alike. In response, the College of Professional Studies (CPS) offers a Master of Education with a Concentration in Higher Education Administration.

This innovative master's degree program explores complex industry issues such as student demographics, financial concerns, legal and policy requirements, technology, and competitive forces.

Learning and Instruction Concentration

As the field of education evolves, today's educators are constantly challenged to be aware of and incorporate best-in-class practices, new technologies, and the latest research and trends within their classrooms. In response, the CPS offers the Master of Education with a Concentration in Learning and Instruction.

Designed for a broad range of educators, this program provides an in-depth look at the critical issues that are transforming the face of education: technology and distance learning, globalization, creative and critical thinking, assessments, and learning outcomes.

Reflecting the new direction of education, this master's degree program also allows you to choose your area of focus by selecting from degree specializations in math, science, English-language learning, literacy, leadership, and technology.

Whether you are a classroom teacher or an administrator or work in youth development, community education, early childhood, or in a before/aftercare program, you have an opportunity to gain new perspectives and acquire fresh strategies for meeting the needs of today's students. This program seeks to produce graduates empowered to implement new ideas and innovative strategies that are designed to improve educational effectiveness.

Special Education Concentration

Demand for graduate-level-prepared special education practitioners is on the rise, driven by heightened degree requirements and a shortage of licensed, qualified teachers. In response, the CPS is pleased to offer the Master of Education with a Concentration in Special Education. Designed for educators who are licensed at the initial or professional level in another discipline, this innovative master's degree program seeks to prepare you to meet the special needs of students across a variety of school environments.

This program meets the Massachusetts Department of Elementary and Secondary Education standards and competencies for an additional licensure as a Teacher of Students with Moderate Disabilities, PreK–8 and 5–12.

In this advanced program, you have an opportunity to explore specific topics on modifying curriculum, designing curriculum-based assessments, managing severe behaviors, developing individualized education programs (IEPs), leveraging community resources, and improving literacy. As a result, you have an opportunity to enhance your ability to meet the needs of a diverse student population and to achieve the competencies required for this specialized license.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

EDU 6050	Education as an Advanced Field of Study	5
EDU 6051	Culture, Equity, Power, and Influence	4

Concentration

Complete one of the following five concentrations:

Concentration in eLearning and Instructional Design

Required Courses		
EDU 6319	How People Learn	4
EDU 6321	Models for Learning Design	4
EDU 6323	Technology as a Medium for Learning	4
EDU 6324	Competencies, Assessment, and Learning Analytics	4
EDU 6331	E-Learning Design as a Collaborative Profession	4
Complete the following course last:		
EDU 6225	Capstone	4
Complete three of the following:		12
EDU 6332	Open Learning	
EDU 6333	Social Media and Beyond	
EDU 6558	Issues in Education	
EDU 6202	Faculty, Curriculum, and Academic Community	

EDU 6329	Connecting Theory and Practice (This course should be taken at least 2 terms prior to Capstone to allow time for implementing a workplace-based experiential project that you will design as the signature assignment for the course.)	
EDU 6340	Learning Analytics Concepts and Theories	
EDU 6330	Digital Media Literacy	
EDU 6321	Models for Learning Design	

Concentration in Higher Education Administration

Required Courses		
EDU 6201	The Landscape of Higher Education	4
EDU 6324	Competencies, Assessment, and Learning Analytics	4
EDU 6447	The Demographics of Higher Education	4
Complete one of the following:		4
EDU 6202	Faculty, Curriculum, and Academic Community	
EDU 6203	Education Law, Policy, and Finance	
EDU 6221	Enrollment, Retention, Graduation, Success	
Complete one of the following:		4
EDU 6450	The Globalization of Education	
INT 6900	International Field Study Experience	
Elective Courses		12
Complete 12 quarter hours from the following:		12
EDU 6520	Learning and the Brain: Translating Research into Practice	
EDU 6319	How People Learn	
EDU 6332	Open Learning	
EDU 6330	Digital Media Literacy	
EDU 6558	Issues in Education	
EDU 6300	Introduction to Language and Linguistics	
EDU 6534	Bilingualism, Second Language, and Literacy Development	
EDU 6182	Educational Statistics	
Complete the following course last:		
EDU 6225	Capstone	

Concentration in Learning Analytics

Required Courses		
EDU 6340	Learning Analytics Concepts and Theories	4
EDU 6341	Introduction to Data Mining in Education	4
EDU 6343	Predictive Modeling for Learning Analytics	4
EDU 6344	Data Visualization for Learning Analytics	4
EDU 6345	Text Mining for Learning Analytics	4
EDU 6324	Competencies, Assessment, and Learning Analytics	4
EDU 6182	Educational Statistics	4
EDU 6319	How People Learn	4
Complete the following course last:		
EDU 6225	Capstone	4

Concentration in Learning and Instruction

Required Courses		
EDU 6330	Digital Media Literacy	4
EDU 6328	Policy and Leadership	4
EDU 6437	Assessment in Education	4
Complete the following course last:		4
EDU 6225	Capstone	
Complete one of the following:		4
EDU 6465	Critical and Creative Thinking	
EDU 6520	Learning and the Brain: Translating Research into Practice	
EDU 6319	How People Learn	
Complete four courses (16 quarter hours) from any other concentration:		16
EDU 6201	The Landscape of Higher Education	
EDU 6447	The Demographics of Higher Education	
EDU 6221	Enrollment, Retention, Graduation, Success	
EDU 6450	The Globalization of Education	
EDU 6332	Open Learning	
EDU 6323	Technology as a Medium for Learning	
EDU 6426	Developmental Language, Literacy, and Writing: Assessment and Instruction	
EDU 6528	Adaptive Learning/Behavior Management Strategies: Consultation and Collaboration	
EDU 6429	Variations in Child and Adolescent Development	
EDU 6431	Developing Skills and Accessing Ideas: Curriculum	
EDU 6558	Issues in Education	
EDU 6185	English-Language Learners in the General Education Classroom	
EDU 6300	Introduction to Language and Linguistics	
EDU 6534	Bilingualism, Second Language, and Literacy Development	
EDU 6182	Educational Statistics	
EDU 6438	Teachers as Curriculum Leaders	

Concentration in Special Education

Required Courses		
EDU 6425	Special Education: Role of Special Educators in an Inclusive School	4
EDU 6426	Developmental Language, Literacy, and Writing: Assessment and Instruction	4
EDU 6528	Adaptive Learning/Behavior Management Strategies: Consultation and Collaboration	4
EDU 6569	Differentiated Instruction and Assessment in Mathematics	4
EDU 6874	Practicum, Portfolio, and Panel Review	4
Electives		

Complete 16 quarter hours from the following:		16
EDU 6185	English-Language Learners in the General Education Classroom	
EDU 6429	Variations in Child and Adolescent Development	
EDU 6530	Beyond Behavior Management	
EDU 6431	Developing Skills and Accessing Ideas: Curriculum	
EDU 6437	Assessment in Education	
EDU 6465	Critical and Creative Thinking	
EDU 6520	Learning and the Brain: Translating Research into Practice	
EDU 6558	Issues in Education	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Analytics, MPS

With the proliferation of data across all sectors of the global economy, there is an immediate need for individuals to be knowledgeable in how to harness this data for continuous analysis and study. This spectrum spans from commercial to nonprofit, from higher education to government and is constantly expanding with new sectors, as data mining becomes the standard for knowledge gathering in the digital age.

The Master's in Analytics helps to meet the demand from employers with a graduate program that provides students with an end-to-end analytics education through a core curriculum with integrated experiential learning opportunities. The program prepares students with a deep understanding of the mechanics of working with data (i.e., its collection, modeling, and structuring) along with the capacity to identify and communicate data-driven insights that ultimately influence decisions.

Not only will students graduate with a portfolio of work samples that demonstrate their range and depth of skill, they will be part of a larger network of analytics professionals who will serve them now and in the future.

- Build portfolios of real-world projects demonstrating competency with key technologies, visualization and communication techniques, and the ability to translate information into recommended actions.
- Gain a core analytical skillset upon which to layer more specialized technical skillsets or industry-specific applications.
- Develop a relationship to industry leaders and peers so that you may leverage your Northeastern education long after your formal education ends.
- Choose from a host of flexible programming options—all of which share an industry-defined core curriculum and a required, credit-bearing experiential requirement.
- Anticipate and contribute to the future direction of data analytics.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

ALY 6000	Introduction to Analytics	3
ALY 6010	Probability Theory and Introductory Statistics	3
ALY 6015	Intermediate Analytics	3
ALY 6050	Introduction to Enterprise Analytics	3
ALY 6070	Communication and Visualization for Data Analytics	3

Concentration

Complete one of the following three concentrations:

Concentration in Statistical Modeling

ALY 6110	Data Management and Big Data	3
ALY 6020	Predictive Analytics	3
ALY 6040	Data Mining Applications	3
ALY 6983	Topics	3
GIS 5102	Fundamentals of GIS Analysis	3

Concentration in Evidence-Based Modeling

ALY 6060	Decision Support and Business Intelligence	3
ALY 6100	Data-Driven Decision Making	3
ALY 6120	Leadership in Analytics	3
ALY 6040	Data Mining Applications	3
ALY 6130	Risk Management for Analytics	3

Concentration in Informational Design

ALY 6030	Data Warehousing and SQL	3
ALY 6040	Data Mining Applications	3
ITC 6015	Enterprise Information Architecture	3
ITC 6020	Information Systems Design and Development	3
ALY 6060	Decision Support and Business Intelligence	3

Experiential Learning Course

ALY 6080	Integrated Experiential Learning	3

Experiential Capstone Course

ALY 6980	Capstone	3

Electives

Complete three of the following:		9
ITC 6015	Enterprise Information Architecture	
ITC 6045	Information Technology Policy, Ethics, and Social Responsibility	
ITC 6310	Information Security Governance	
INPS 5184	Interdisciplinary Professional Foundations	
GIS 5101	Introduction to Geographic Information Systems	
GIS 5201	Advanced Spatial Analysis	
ITC 6020	Information Systems Design and Development	
LDR 6110	Leading Teams	
ALY 6020	Predictive Analytics	
ALY 6100	Data-Driven Decision Making	
ALY 6110	Data Management and Big Data	
ALY 6983	Topics	
ALY 6120	Leadership in Analytics	

ALY 6130	Risk Management for Analytics
PJM 6000	Project Management Practices

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Digital Media, MPS

Students in the Master of Professional Studies in Digital Media will build their skills and expertise while gaining experience using a variety of industry-standard and cutting-edge technologies and tools. Our curriculum is organized around three types of experiences: core courses, concentration electives, and a capstone that can be completed as an individual thesis or a team project.

Our core courses in media creation, interactive design, usability, design thinking, and narrative structure provide a baseline for producing content-rich experiences. A series of electives are offered in seven distinctive areas: 3-D animation, game design, digital video, social media, digital media management, or one of two tracks in interactive design: visual design or usability and production. In the capstone experience, you'll work with the guidance of faculty to channel your passion into a project that provides tangible evidence of your abilities.

Whether you are a full- or part-time student, our cohort structure allows you to build meaningful working relationships with students from around the globe. Team-based assignments strengthen your project management and leadership skills and allow you to take part in the design and development of more complex media projects than you could by working alone. The team efforts will also prepare you for your future as a professional in digital media's collaboration-oriented culture.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

Complete 22 quarter hours:		22
DGM 6122	Foundations of Digital Storytelling	
DGM 6145	Information Technology and Creative Practice	
DGM 6521	Web Creation for Content Management Systems	
Complete one of the following:		4
DGM 6140	Sound Design	
DGM 6168	Usability and Human Interaction	
Complete one pair of the following:		8
DGM 6890	Thesis Proposal Development	
DGM 7990	Thesis	
or		
DGM 7980	Capstone	
Technical course from the workshops list		

Concentration

Complete one of the following six concentrations:

Concentration in 3-D Animation

Complete 20 quarter hours from the following:		20
DGM 6450	Animation Basics	
DGM 6510	3-D Modeling	
DGM 6530	Character Animation	
DGM 6535	Rigging Principles and Techniques	
DGM 6540	Compositing	

Concentration in Digital Media Management

Complete 20 quarter hours from the following:		20
DGM 6230	Digital Media Entrepreneurship	
DGM 6280	Managing for Digital Media	
DGM 6285	Interactive Marketing Fundamentals	
DGM 6290	Social Media and Brand Strategy Implementation	
DGM 6279	Project Management for Digital Media	
CMN 6080	Intercultural Communication	

Concentration in Digital Video

Complete 20 quarter hours from the following:		20
DGM 6300	Digital Capture and Output	
DGM 6435	Digital Video Production	
DGM 6440	Editing in the Digital Studio	
DGM 6520	Lighting for the Camera	
DGM 6540	Compositing	
DGM 6545	Documentary and Nonfiction Production	
DGM 6430	Screenwriting: Linear and Interactive	

Concentration in Game Design

Complete 20 quarter hours from the following:		20
DGM 6308	Intermediate Programming for Digital Media	
DGM 6400	Game Design Fundamentals	
DGM 6405	Game Development	
DGM 6408	Game Design Algorithms and Data Structures	
DGM 6410	Game Design Technology Lab	
DGM 6508	Game Development Intensive	

Concentration in Interactive Design

Complete 20 quarter hours from the following:		20
DGM 6451	Web Development	
DGM 6268	Usable Design for Mobile Digital Media	
DGM 6308	Intermediate Programming for Digital Media	
TCC 6110	Information Architecture	
DGM 6525	Research Methods for Global User Experiences	
TCC 6710	Content Strategy	

Concentration in Social Media

Complete four of the following:		14-15
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	
CMN 6065	Implementation and Management of Social Media Channels and Online Communities	
DGM 6285	Interactive Marketing Fundamentals	

DGM 6290	Social Media and Brand Strategy Implementation
TCC 6710	Content Strategy

Free Elective

In addition to their concentration electives, students are encouraged to explore new areas within the digital media space offered both by the program and through related master's programs in the College of Professional Studies. Students are also able to request another digital media course offering as their free elective, as long as they met its prerequisite.

Complete one of the following:

ALY 6110	Data Management and Big Data	3
DGM 6322	Advanced Digital Storytelling	4
DGM 6550	Search Engine Optimization: Strategy and Implementation	4
INPS 5184	Interdisciplinary Professional Foundations	3
ITC 6410	Fundamentals of Human Behaviors for Interactive Systems	3

Or, with approval, complete one course from a digital media concentration.

Workshops

Optional digital media workshops are designed to provide valuable technical skills and tools for students in all graduate degree programs. Students may complete one of the following:

DGM 6501	Web Creation Boot Camp	2
DGM 6505	Modeling and Rendering (Intensive)	2
DGM 6506	Introduction to Digital Video	2
DGM 6508	Game Development Intensive	2
DGM 6509	Integrated Suite Workshop	2
DGM 6511	Web Creation Bootcamp 2	2
DGM 6513	Single-Lens Reflex Camera Workshop	2
DGM 6515	Introduction to After Effects	2
DGM 6518	Game Programming Intensive 1	2
DGM 6519	Game Programming Intensive 2	2
TCC 6620	Collecting User Data	2

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Digital Media, MPS—ALIGN Program

Students in the Master of Professional Studies in Digital Media will build their skills and expertise while gaining experience using a variety of industry-standard and cutting-edge technologies and tools. Our curriculum is organized around three types of experiences: core courses, concentration electives, and a capstone that can be completed as an individual thesis or a team project.

Our core courses in media creation, interactive design, usability, design thinking, and narrative structure provide a baseline for producing content-rich experiences. A series of electives are offered in seven distinctive areas: 3-D animation, game design, digital video, social media, digital media management, or one of two tracks in interactive design: visual design or usability and production. In the capstone experience, you'll work with the guidance of faculty to channel your passion into a project that provides tangible evidence of your abilities.

Whether you are a full- or part-time student, our cohort structure allows you to build meaningful working relationships with students from around the globe. Team-based assignments strengthen your project management and leadership skills and allow you to take part in the design and development of more complex media projects than you could by working alone. The team efforts will also prepare you for your future as a professional in digital media's collaboration-oriented culture.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Foundation Courses

DGM 6105	Visual Communications Foundation	4
DGM 6108	Programming Foundations for Digital Media	4
DGM 6109	Lab for DGM 6108	2
DGM 6501	Web Creation Boot Camp	2

Required Core Courses

DGM 6122	Foundations of Digital Storytelling	4
DGM 6145	Information Technology and Creative Practice	4
DGM 6521	Web Creation for Content Management Systems	2
Complete one of the following:		4
DGM 6140	Sound Design	
DGM 6168	Usability and Human Interaction	
Complete one pair of the following:		8
DGM 6890	Thesis Proposal Development	
DGM 7990	Thesis	
or		
DGM 7980	Capstone	
Technical course from the workshops list		

Concentrations

Concentration in 3-D Animation

DGM 6450	Animation Basics	4
DGM 6510	3-D Modeling	4
DGM 6530	Character Animation	4
DGM 6535	Rigging Principles and Techniques	4
DGM 6540	Compositing	4

Concentration in Digital Media Management

Complete 20 quarter hours from the following:		20
DGM 6230	Digital Media Entrepreneurship	
DGM 6280	Managing for Digital Media	
DGM 6285	Interactive Marketing Fundamentals	
DGM 6290	Social Media and Brand Strategy Implementation	
DGM 6279	Project Management for Digital Media	
CMN 6080	Intercultural Communication	

Concentration in Digital Video

Complete 20 quarter hours from the following:		20

DGM 6435	Digital Video Production	
DGM 6440	Editing in the Digital Studio	
DGM 6520	Lighting for the Camera	
DGM 6540	Compositing	
DGM 6545	Documentary and Nonfiction Production	
DGM 6430	Screenwriting: Linear and Interactive	

Concentration in Game Design

Complete 20 quarter hours from the following:		20
DGM 6308	Intermediate Programming for Digital Media	
DGM 6400	Game Design Fundamentals	
DGM 6405	Game Development	
DGM 6408	Game Design Algorithms and Data Structures	
DGM 6410	Game Design Technology Lab	
DGM 6508	Game Development Intensive	

Concentration in Interactive Design

Complete 20 quarter hours from the following:		
DGM 6461	Interactive Information Design 1	4
Complete four courses from one of the following tracks:		
Design Track		
DGM 6217	Typography for Interactivity	4
DGM 6463	Interactive Information Design 2	4
DGM 6317	Screen-Based Publication Design	4
DGM 6471	Designing Infographics	4
DGM 6895	Digital Portfolio Capstone	4
Usability and Development Track		
DGM 6451	Web Development	4
DGM 6268	Usable Design for Mobile Digital Media	4
DGM 6308	Intermediate Programming for Digital Media	4
DGM 6525	Research Methods for Global User Experiences	4
TCC 6110	Information Architecture	4
TCC 6710	Content Strategy	4

Concentration in Social Media

CMN 6035	Legal, Policy, and Ethical Issues in the Digital Era	3
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	3
CMN 6065	Implementation and Management of Social Media Channels and Online Communities	3
DGM 6285	Interactive Marketing Fundamentals	4
DGM 6290	Social Media and Brand Strategy Implementation	4
TCC 6710	Content Strategy	4

Free Electives

Complete one of the following:		3-4
ALY 6110	Data Management and Big Data	
DGM 6125	Time-Based Media	
DGM 6300	Digital Capture and Output	
DGM 6322	Advanced Digital Storytelling	
DGM 6530	Character Animation	
DGM 6943	Integrative Experiential Learning	
INPS 5184	Interdisciplinary Professional Foundations	
ITC 6410	Fundamentals of Human Behaviors for Interactive Systems	

Workshops

Optional digital media workshops are designed to provide valuable technical skills and tools for students in all graduate degree programs. Students may complete one of the following:

DGM 6506	Introduction to Digital Video	2
DGM 6509	Integrated Suite Workshop	2
DGM 6515	Introduction to After Effects	2
DGM 6518	Game Programming Intensive 1	2
DGM 6519	Game Programming Intensive 2	2
TCC 6620	Collecting User Data	2
TCC 6630	Introduction to XML	2

Program Credit/GPA Requirements

56 total quarter hours required
Minimum 3.000 GPA required

Geospatial Services, MPS

The Northeastern University MPS in Geospatial Services program is designed for working professionals striving to maintain competitive, leading-edge capabilities at a time of rapidly growing utilization of geospatial data for diversity of government and business intelligence needs. Program strengths are highly correlated with geospatial workforce requirements as identified by geospatial enterprise leaders from government and industry (e.g., GEOINT Essential Body of Knowledge (http://usgif.org/certification/geoint_EBK)). Our curriculum incorporates tools, technologies, and services required in three primary sectors:

- *Location-based geodata* (collect, manage, distribute spatial information and imagery)
- *Geo-applications and devices* (devices and software for creating, visualizing, and sharing geospatial information)
- *Geo-expert industries* (turn location-based information into insights for commercial and government organizations)

Available 100 percent online and built to Northeastern University's high academic standards, our program's experiential focus emphasizes the connections between learning and workplace needs.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

GIS 5101	Introduction to Geographic Information Systems	3
GIS 5102	Fundamentals of GIS Analysis	3
RMS 5105	Fundamentals of Remote Sensing	3
GIS 5201	Advanced Spatial Analysis	3
GIS 6980	Capstone	1-4

Complete two of the following:		6-7
LDR 6100	Developing Your Leadership Capability	
PJM 5900	Foundations of Project Management	
ITC 6045	Information Technology Policy, Ethics, and Social Responsibility	
ITC 6020	Information Systems Design and Development	

Concentrations

If students prefer to focus their studies on a particular concentration, they may select 18 quarter hours from one of the concentrations below and complement their studies with 6 quarter hours of open elective courses to meet the minimum 45-quarter-hour degree requirement.

Students are not required to complete a concentration. Any combination of 24 quarter hours from concentration and elective courses will satisfy degree requirements.

Geographic Information Systems

Complete six of the following:		18
GIS 6320	Use and Applications of Free and Open-Source GIS Desktop Software	
GIS 6340	GIS Customization	
GIS 6350	Planning a GIS Implementation	
GIS 6360	Spatial Databases	
GIS 6370	Internet-Based GIS	
GIS 6385	GIS/Cartography	
GIS 6390	Business Applications of Geographic Information Systems	
GIS 6391	Healthcare Applications of Geographic Information Systems	
GIS 6394	Crisis Mapping for Humanitarian Action	
GIS 6395	Geospatial Analysis of Crime	
GIS 6396	GIS for Defense, Homeland Security, and Emergency Response	

Remote Sensing

Required Course		
RMS 6110	Digital Image Processing	3
Complete five of the following:		15
RMS 6210	Technology, Operations, and Requirements for Drones, Helicopters, and Airplanes	
RMS 6230	Remote Sensing and Global Change	
RMS 6240	Introduction to Radar and LIDAR Remote Sensing	
RMS 6250	Remote Sensing of Vegetation	
RMS 6270	Remote Sensing for Disaster Management	
RMS 6280	Automated Feature Extraction for the Geospatial Professional	
RMS 6290	Spectroscopic Image Analysis	
RMS 6292	Photogrammetry and GPS	
GIS 6394	Crisis Mapping for Humanitarian Action	

Statistical Analytics

ALY 6110	Data Management and Big Data	3
ALY 6020	Predictive Analytics	3
ALY 6040	Data Mining Applications	3
ALY 6983	Topics	3
ALY 6070	Communication and Visualization for Data Analytics	3
Open elective from GIS, RMS		3

Electives

Open electives can be fulfilled by choosing either 6 quarter hours from the courses listed above or below. Please note that if you are completing the concentration in statistical analytics, you will need to complete 9 quarter hours of open elective courses.

COP 6940	Personal and Career Development	3-4
INT 6943	Integrative Experiential Learning	3

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Informatics, MPS

A relatively new and rapidly evolving area, informatics is increasingly used to solve today's problems. Whether it's used to create information and communication technologies, design decision support systems, develop 3-D visualizations, or devise mobile applications, informatics can be applied across a wide range of industries to address a variety of privacy, security, healthcare, environmental, educational, and social challenges. In response, Northeastern University offers the Master of Professional Studies in Informatics. Designed to improve your computing skills and enhance your knowledge of computing applications, this master's degree seeks to prepare you to excel in the fast-growing and dynamic field of informatics.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

ITC 6400	Foundations of Informatics	3
ITC 6000	Database Management Systems	3
ITC 6010	Information Technology Strategy and Governance	3
ITC 6020	Information Systems Design and Development	3
ITC 6035	Information Technology Project Management	3
Required Capstone and Experiential Learning Courses		
ITC 6040	Informatics Capstone	3
INT 6940	Experiential Learning Projects for Professionals	1-4

Concentration Courses

Students are not required to complete one of the concentrations below, but they must complete 24 credit hours of course work approved by their career and academic coach.

Concentration in Information Security Management

ITC 6300	Foundations of Information Security	3
ITC 6305	IT Infrastructure (Systems, Networks, Telecom)	3

ITC 6310	Information Security Governance	3
ITC 6315	Information Security Risk Management	3
ITC 6320	Information Security Technology (Complete three of the following courses)	3
Complete three of the following:		9-11
ITC 6325	CISA Preparation	
ITC 6330	CISSP Preparation	
ITC 6345	Systems and Network Administration	
MIS 6080	Network Security Concepts	
MIS 6082	Network Protection	

Concentration in Geographic Information Systems

GIS 5101	Introduction to Geographic Information Systems	3
GIS 5102	Fundamentals of GIS Analysis	3
RMS 5105	Fundamentals of Remote Sensing	3
GIS 5201	Advanced Spatial Analysis	3
Complete two of the following:		6
GIS 6340	GIS Customization	
GIS 6350	Planning a GIS Implementation	
GIS 6360	Spatial Databases	
GIS 6370	Internet-Based GIS	
GIS 6385	GIS/Cartography	
GIS 6390	Business Applications of Geographic Information Systems	
GIS 6391	Healthcare Applications of Geographic Information Systems	

Concentration in Leading and Managing Technical Projects

PJM 6000	Project Management Practices	3
PJM 6205	Leading and Managing Technical Projects	3
PJM 6210	Communication Skills for Project Managers	3
PJM 6215	Leading Remote Project Teams	3
PJM 6220	Planning and Scheduling Technical Projects	3
ITC 6305	IT Infrastructure (Systems, Networks, Telecom)	3

Concentration in Program and Portfolio Management

PJM 6710	Introduction to Program and Portfolio Management	3
PJM 6715	Advanced Program Management	3
PJM 6720	Advanced Portfolio Management	3
PJM 6725	Program and Portfolio Leadership	3
PJM 6730	Program and Portfolio Evaluation	3
PJM 6735	Program and Portfolio Management Capstone	3

Concentration in Analytics

ALY 6000	Introduction to Analytics	3
ALY 6010	Probability Theory and Introductory Statistics	3
ALY 6020	Predictive Analytics	3
ALY 6040	Data Mining Applications	3
ALY6070		
Complete three of the following:		9
ALY 6050	Introduction to Enterprise Analytics	
ALY 6060	Decision Support and Business Intelligence	
ALY 6100	Data-Driven Decision Making	
ALY 6110	Data Management and Big Data	
ALY 6120	Leadership in Analytics	
ALY 6130	Risk Management for Analytics	

Concentration in Human-Centered Informatics

ITC 6410	Fundamentals of Human Behaviors for Interactive Systems	3
DGM 6461	Interactive Information Design 1	4
DGM 6168	Usability and Human Interaction	4
DGM 6268	Usable Design for Mobile Digital Media	4
Complete three of the following:		9-12
DGM 6463	Interactive Information Design 2	
DGM 6525	Research Methods for Global User Experiences	
ALY 6070	Communication and Visualization for Data Analytics	
ITC 6355	Web Application Design and Development	
ITC 7120	Healthcare Information Systems	
DGM 6145	Information Technology and Creative Practice	
GIS 6370	Internet-Based GIS	

Concentration in Cloud Computing Application and Management

ITC 6420	Introduction to Cloud Computing Applications and Management	3
ITC 6430	Enterprise Information Technology Service Management	3
ITC 6015	Enterprise Information Architecture	3
ITC 6320	Information Security Technology	3
ITC 6355	Web Application Design and Development	3
Complete three of the following:		10-12
ALY 6050	Introduction to Enterprise Analytics	
PJM 6205	Leading and Managing Technical Projects	
DGM 6145	Information Technology and Creative Practice	
MIS 6080	Network Security Concepts	
MIS 6082	Network Protection	

Elective Courses

Select sufficient elective credits (if necessary) to reach minimum credit requirements for the degree.

DGM 6500	Working with Digital Images	2
DGM 6501	Web Creation Boot Camp	2
DGM 6511	Web Creation Bootcamp 2	2
INPS 5184	Interdisciplinary Professional Foundations	2-3

or EDU 6184	Interdisciplinary Foundations	
ITC 6030	Computer Systems and Networks	3
ITC 6340	Mobile and Wireless Networks and Applications	3
ITC 6045	Information Technology Policy, Ethics, and Social Responsibility	3
GIS 5101	Introduction to Geographic Information Systems	3
GIS 5102	Fundamentals of GIS Analysis	3
GIS 6360	Spatial Databases	3
PJM 6000	Project Management Practices	3
TCC 6110	Information Architecture	4

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Applied Nutrition, MS

Increased attention on disease prevention through better dietary habits has heightened the demand for skilled nutrition professionals.

To meet the demands and need in the industry, this Master of Science in Applied Nutrition degree is designed to build upon your clinical knowledge and to allow you to concentrate in one of four specialty areas. This advanced program is open to individuals who hold undergraduate degrees in health science, dietetics, or a related area.

Led by real-world practitioners, including dietitians, an exercise scientist, and a clinical psychologist, this innovative nutrition degree seeks to provide you with a solid grounding in nutrition, metabolism, disease prevention, health promotion, and clinical behavior. Complementing the core nutrition courses is the college's renowned nutrition practicum that allows you to work directly with registered dietitians, fitness specialists, as well as other health professionals.

Further differentiating this master's degree in nutrition is the option to choose from four degree concentrations: business and entrepreneurship in nutrition; nutrition education; nutrition and fitness; and obesity and nutritional health. This degree program seeks to give you the knowledge and skills you need to succeed in the field of nutrition.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

NTR 6100	Advanced Nutrition and Metabolism	4
NTR 6110	Medical Nutrition Therapy	4
NTR 6112	Research Methods in Nutrition	4
NTR 6115	Health Promotion/Disease Prevention	4
NTR 6118	Clinical Health Behavior Change	4
NTR 6165	Food and Society	4
NTR 6866	Applied Research in Nutrition (Recommended as the last course taken)	1-4

Concentration

Complete one of the following four concentrations:

Concentration in Business and Entrepreneurship in Nutrition

NTR 6155	Nutrition Entrepreneurship	3
NTR 6130	Healthcare and Nutrition Communication	4
PJM 5900	Foundations of Project Management	4
NTR 6202	The Financing of Nutrition and Wellness	3
NTR 7880	Nutrition in Practice	1-4

Concentration in Nutrition Education

Required Courses		
NTR 6200	Nutrition Education	4
NTR 6130	Healthcare and Nutrition Communication	4
NTR 6201	Commercialization of Nutrition and Nutritional Information	3
NTR 7880	Nutrition in Practice	1-4
Nutrition Education Elective		
Complete one of the following:		4
NTR 6119	Pediatric Nutrition	
NTR 6120	Healthy Aging: Nutrition Strategies for Optimal Longevity	
NTR 6101	Nutrition Program Planning	

Concentration in Nutrition and Fitness

Required Courses		
NTR 7147	Sports and Fitness Nutrition	3
NTR 6148	Exercise Physiology	3
NTR 6150	Sports Psychology	3
NTR 7880	Nutrition in Practice	1-4
Nutrition and Fitness Elective		
Complete one of the following:		4
NTR 6120	Healthy Aging: Nutrition Strategies for Optimal Longevity	
NTR 6101	Nutrition Program Planning	

Concentration in Obesity and Nutritional Health

Required Courses		
NTR 7130	Overweight and Obesity 1	4
NTR 7132	Overweight and Obesity 2	4
NTR 6201	Commercialization of Nutrition and Nutritional Information	3
NTR 7880	Nutrition in Practice	1-4
Obesity and Nutritional Health Elective		
Complete one of the following:		4
NTR 7140	Wellness and Nutrition	
NTR 7135	Eating Disorders in Children and Adults	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Commerce and Economic Development, MS

Globalization has created a borderless economy with a host of new opportunities and challenges for those engaged in commerce and economic development. While global markets offer exciting growth prospects, navigating the world stage requires in-depth knowledge of the

financial, regulatory, and economic environments and institutions that affect the global economy and international trade. To meet the need for both insight and skills development, Northeastern University's College of Professional Studies—in collaboration with Northeastern University's College of Social Sciences and Humanities—offers the online Master of Science in Commerce and Economic Development.

This graduate-level program integrates economics, leadership, institutional organization, technology, and public policy into a unique and focused educational experience designed to help guide and advance a rewarding career in the private or public sectors.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

CED 6010	Applied Microeconomic Theory	4
CED 6020	Applied Macroeconomic Theory	4
CED 6030	Applied Mathematics and Statistics for Economics	4
CED 6040	Applied Econometrics	4
CED 6050	Commerce and Economic Development	4
CED 6910	Capstone: Master's Project	5

Elective Courses

Complete five of the following:		19-20
CED 6070	Economics of Human Capital	
CED 6080	Commerce, Institutions, and Innovation	
CED 6090	Cultural Economic Development	
CED 6110	Law and Economics	
CED 6120	Environmental Economics	
CED 6130	Sustainable Economic Development	
CED 6140	Economics of E-Commerce	
COP 6940	Personal and Career Development	
INPS 5184	Interdisciplinary Professional Foundations	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Corporate and Organizational Communication, MS

Across all industries and professions, strong written and oral communication skills are essential to success. Whether you are seeking to advance in a communications-related field or get ahead in your current organization, this program seeks to provide the practical knowledge and valuable perspectives you need to communicate across a variety of contexts and situations.

From negotiation and writing to crisis management and public speaking, the Master of Science in Corporate and Organizational Communication degree program examines topics that are critical to effective organizational communication. Incorporating best practices, case studies, and classroom learning, courses within this innovative master's degree in communication address complex communication challenges, seeking to provide you with a distinct advantage in today's competitive marketplace.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

Note: Introduction to Organizational Communication (CMN 6000) is required for students who do not have any professional experience in communication. Students with professional communication experience should begin the program with Strategic Communication Management (CMN 6010):

CMN 6000 and INT 6000	Introduction to Organizational Communication and Writing Lab	3-4
CMN 6010	Strategic Communication Management	3
CMN 6020	Ethical Issues in Organizational Communication	3
CMN 6080	Intercultural Communication	3
CMN 6090	Organizational Culture, Climate, and Communication	3
CMN 6100	Communication Networks and Managing Information	3
CMN 6910	Organizational Communication Assessment	3

Capstone Course Options

Complete one of the following:		3
CMN 6943	Integrative Experiential Learning	
CMN 6940	Projects for Professionals	

Elective Courses

Note: Students who take Introduction to Organizational Communication (CMN 6000) are only required to take two courses in this section.

Complete three of the following:		5-10
CMN 6015	Introduction to the Digital Era: The Power of Social Media	
CMN 6025	Digital Era Skills: Platforms, Tools, and Techniques	
CMN 6050	Crisis Communication	
CMN 6061	Personal Branding	
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	
CMN 6060	Negotiation, Mediation, and Facilitation	
COP 6940	Personal and Career Development	
INPS 5184	Interdisciplinary Professional Foundations	
INT 6943	Integrative Experiential Learning	
INT 6900	International Field Study Experience	
INT 6940	Experiential Learning Projects for Professionals	

Concentration

Complete one of the following eight concentrations:

Concentration in Human Resource Management

HRM 6005	Creating a High-Performance Organization: Strategic Organizational and HRM Choices	3

HRM 6010	Total Compensation	3
HRM 6020	Strategic Recruitment, Training, and Performance Management	3
HRM 6030	Employee Rights and Employer Obligations	3
HRM 6040	High-Performance Human Resources Systems and Development	3

Concentration in Public and Media Relations

Required Courses		
PBR 6100	Introduction to Public Relations	3
PBR 6130	Public Relations Writing Seminar 1	3
PBR 6140	Public Relations Writing Seminar 2	3
PBR 6710	Public Relations Research: Understanding External Audiences	3
Public and Media Relations Electives		
Complete two of the following:		6-7
CMN 6025	Digital Era Skills: Platforms, Tools, and Techniques	
CMN 6035	Legal, Policy, and Ethical Issues in the Digital Era	
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	
DGM 6290	Social Media and Brand Strategy Implementation	
PBR 6120	Public Relations Legal Issues	
PBR 6125	Community Relations and Corporate Social Responsibility	

Concentration in Leadership

Required Courses		
LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6150	Transforming Organizations	3
Leadership Elective		
Complete one of the following:		3
LDR 6135	Ethical Leadership	
LDR 6140	Strategic Leadership	

Concentration in Project Management

Required Courses		
Note: Students with project management experience are not required to take PJM 5900:		
PJM 6000	Project Management Practices	3
PJM 5900	Foundations of Project Management	4
PJM 6025	Project Scheduling and Cost Planning	3
PJM 6015	Project Risk Management	3
Project Management Electives		
Note: Students who take PJM 5900 are required to take only one course in this section.		
Complete two of the following:		6-7
PJM 5900	Foundations of Project Management	
PJM 6125	Project Evaluation and Assessment	
PJM 6135	Project Quality Management	
PJM 6140	Managing Troubled Projects	
PJM 6710	Introduction to Program and Portfolio Management	

Concentration in Social Media and Online Communication

Complete five of the following (CMN 6025, 6045, and 6065 are required):		15-18
CMN 6015	Introduction to the Digital Era: The Power of Social Media ((Students may waiver CMN 6015 if they have social media experience. Please consult with your academic advisor.))	
CMN 6025	Digital Era Skills: Platforms, Tools, and Techniques	
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	
CMN 6065	Implementation and Management of Social Media Channels and Online Communities	
Complete one (or two, if CMN 6015 has been waived) of the following:		
CMN 6035	Legal, Policy, and Ethical Issues in the Digital Era	
DGM 6285	Interactive Marketing Fundamentals	
DGM 6290	Social Media and Brand Strategy Implementation	
TCC 6710	Content Strategy	
CMN 6040	Consumer Behaviors in the Online Environment	

Concentration in Usability/User Experience

TCC 6710	Content Strategy	4
TCC 6470	Web Accessibility for Technical Communicators	4
TCC 6490	Usability Testing for Technical Communicators	4
DGM 6268	Usable Design for Mobile Digital Media	4
TCC 6610	Prototyping	2
TCC 6620	Collecting User Data	2

Concentration in Cross-Cultural Communication

Required Courses		
CMN 6082		
CMN 6085	Strategies for Cross-Cultural Facilitation and Negotiation	3
Complete 12 quarter hours from one of the following:		
Social Justice Track (suggested)		
PBR 6100	Introduction to Public Relations	3
HSV 6120	Social Inequality, Social Change, and Community Building	3
ITC 6045	Information Technology Policy, Ethics, and Social Responsibility	3
HRM 6040	High-Performance Human Resources Systems and Development	3
International Track (suggested)		
GST 6100	Globalization and Global Politics and Economics	4
GST 6101	Global Literacy, Culture, and Community	4

LDR 6145	Global Leadership	3
INT 6900	International Field Study Experience	3,4

Concentration in Leading Communication Strategy and Talent Development

Required Courses		9
CMN 6200	Strategic Communications Advisor: Roles and Responsibilities	
CMN 6201	Managing Communication Resources	
CMN 6202	Management Symposium	
Complete 9 quarter hours:		9
HRM 6020	Strategic Recruitment, Training, and Performance Management	
LDR 6120	Organizational Leadership	
PJM 6000	Project Management Practices	
PJM 6215	Leading Remote Project Teams	
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Criminal Justice, MS

Criminal justice and security agencies are under increased scrutiny—challenged to provide efficient and effective services; be transparent in their interactions with the public; and respond to changing local, national, and world conditions. To be successful, justice system leaders need to think strategically, communicate locally, and act ethically while developing comprehensive (and often multijurisdictional) solutions to crime and terrorism problems.

In response, Northeastern University's College of Professional Studies—in collaboration with the School of Criminology and Criminal Justice—offers the Master of Science in Criminal Justice. This innovative online master's degree provides a path to excellence for leaders in law enforcement, courts, private security, and corrections organizations. Academically distinctive, graduate courses in this program emphasize leadership, communication, and ethics—themes that are designed to enhance your leadership capacity and improve your career prospects.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Foundation Courses

CJS 6020	Contemporary Issues in Criminal Justice Policy	3
CJS 6400	Administration of Justice	3
CJS 6405	Criminological Theory for Criminal Justice Leaders	3
CJS 6415	Legal Decision Making and Leadership	3
CJS 6470	Criminal Justice Capstone (Recommended as the last course)	3

Operations Courses

CJS 6425	Research Methods	3
CJS 6435	Program Evaluations	3
CJS 6440	GIS, Evidence-Based Learning, and Policy	3
CMN 6050	Crisis Communication	3

Concentration

Complete one of the following six concentrations:

Concentration in Community and Family Justice

Community and Family Justice Courses		
CJS 6300	Communities and Crime	3
CJS 6330	Youth Justice and Crime	3
CJS 6340	Substance Abuse and Addictions	3
CJS 6305	Criminal Behavior and the Family	3
CJS 6135	Intimate Partner Violence	3
Elective		
Complete 3 quarter hours from the following:		3
CJS 6005	Legal and Regulatory Issues for Security Management	
CJS 6010	Advanced Principles of Security Management and Threat Assessment	
CJS 6025	Genocide and War Crimes	
CJS 6030	Organized Crime	
CJS 6035	Corruption, Integrity, and Accountability	
CJS 6040	Human Trafficking and Exploitation	
CJS 6045	Policing Issues around the Globe	
CJS 6050	Models of Intelligence-Led Policing	
CJS 6105	Domestic and International Terrorism	
CJS 6110	Management of Service Industries Security Department	
CJS 6120	Preventing Service Industries Losses	
CJS 6125	Issues in National Security	
CJS 6135	Intimate Partner Violence	
CJS 6140	Security Role: Safety and Environment Protection	
CJS 6145	Correctional Rehabilitation	
CJS 6205	Law Enforcement Management and Planning	
CJS 6300	Communities and Crime	
CJS 6305	Criminal Behavior and the Family	
CJS 6315	Administration of the Adult and Juvenile Correction Systems	
CJS 6320	Community Corrections	
CJS 6325	Probation and Parole	
CJS 6330	Youth Justice and Crime	
CJS 6340	Substance Abuse and Addictions	
CJS 6420	U.S. Policing in the 21st Century	
GST 6300	Security and Terrorism	
LDR 6110	Leading Teams	
LDR 6120	Organizational Leadership	
LDR 6140	Strategic Leadership	
LDR 6360	Dynamics of Change at the Community and Social Level	
INT 6943	Integrative Experiential Learning	

Concentration in Corrections

Corrections Courses		

Complete five of the following:		15
CJS 6145	Correctional Rehabilitation	
CJS 6300	Communities and Crime	
CJS 6315	Administration of the Adult and Juvenile Correction Systems	
CJS 6325	Probation and Parole	
CJS 6320	Community Corrections	
CJS 6340	Substance Abuse and Addictions	
Elective		
Complete 3 quarter hours from the following:		3
CJS 6005	Legal and Regulatory Issues for Security Management	
CJS 6010	Advanced Principles of Security Management and Threat Assessment	
CJS 6025	Genocide and War Crimes	
CJS 6030	Organized Crime	
CJS 6035	Corruption, Integrity, and Accountability	
CJS 6040	Human Trafficking and Exploitation	
CJS 6045	Policing Issues around the Globe	
CJS 6050	Models of Intelligence-Led Policing	
CJS 6105	Domestic and International Terrorism	
CJS 6110	Management of Service Industries Security Department	
CJS 6120	Preventing Service Industries Losses	
CJS 6125	Issues in National Security	
CJS 6135	Intimate Partner Violence	
CJS 6140	Security Role: Safety and Environment Protection	
CJS 6145	Correctional Rehabilitation	
CJS 6205	Law Enforcement Management and Planning	
CJS 6300	Communities and Crime	
CJS 6305	Criminal Behavior and the Family	
CJS 6315	Administration of the Adult and Juvenile Correction Systems	
CJS 6320	Community Corrections	
CJS 6325	Probation and Parole	
CJS 6330	Youth Justice and Crime	
CJS 6340	Substance Abuse and Addictions	
CJS 6420	U.S. Policing in the 21st Century	
GST 6300	Security and Terrorism	
LDR 6110	Leading Teams	
LDR 6120	Organizational Leadership	
LDR 6140	Strategic Leadership	
LDR 6360	Dynamics of Change at the Community and Social Level	
INT 6943	Integrative Experiential Learning	

Concentration in Global Criminal Justice

Global Criminal Justice Courses		
Complete five of the following:		15-16
CJS 6025	Genocide and War Crimes	
CJS 6030	Organized Crime	
CJS 6035	Corruption, Integrity, and Accountability	
CJS 6040	Human Trafficking and Exploitation	
CJS 6045	Policing Issues around the Globe	
CJS 6105	Domestic and International Terrorism	
CJS 6125	Issues in National Security	
GST 6300	Security and Terrorism	
Elective		
Complete 3 quarter hours from the following:		3
CJS 6005	Legal and Regulatory Issues for Security Management	
CJS 6010	Advanced Principles of Security Management and Threat Assessment	
CJS 6025	Genocide and War Crimes	
CJS 6030	Organized Crime	
CJS 6035	Corruption, Integrity, and Accountability	
CJS 6040	Human Trafficking and Exploitation	
CJS 6045	Policing Issues around the Globe	
CJS 6050	Models of Intelligence-Led Policing	
CJS 6105	Domestic and International Terrorism	
CJS 6110	Management of Service Industries Security Department	
CJS 6120	Preventing Service Industries Losses	
CJS 6125	Issues in National Security	
CJS 6135	Intimate Partner Violence	
CJS 6140	Security Role: Safety and Environment Protection	
CJS 6145	Correctional Rehabilitation	
CJS 6205	Law Enforcement Management and Planning	
CJS 6300	Communities and Crime	
CJS 6305	Criminal Behavior and the Family	
CJS 6315	Administration of the Adult and Juvenile Correction Systems	
CJS 6320	Community Corrections	
CJS 6325	Probation and Parole	
CJS 6330	Youth Justice and Crime	
CJS 6340	Substance Abuse and Addictions	
CJS 6420	U.S. Policing in the 21st Century	
GST 6300	Security and Terrorism	
LDR 6110	Leading Teams	
LDR 6120	Organizational Leadership	
LDR 6140	Strategic Leadership	
LDR 6360	Dynamics of Change at the Community and Social Level	
INT 6943	Integrative Experiential Learning	

Concentration in Leadership

Leadership Courses		
LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6150	Transforming Organizations	3
Complete one of the following:		3-6
LDR 6135	Ethical Leadership	
LDR 6140	Strategic Leadership	
Elective		
Complete 3 quarter hours from the following:		3

CJS 6005	Legal and Regulatory Issues for Security Management
CJS 6010	Advanced Principles of Security Management and Threat Assessment
CJS 6025	Genocide and War Crimes
CJS 6030	Organized Crime
CJS 6035	Corruption, Integrity, and Accountability
CJS 6040	Human Trafficking and Exploitation
CJS 6045	Policing Issues around the Globe
CJS 6050	Models of Intelligence-Led Policing
CJS 6105	Domestic and International Terrorism
CJS 6110	Management of Service Industries Security Department
CJS 6120	Preventing Service Industries Losses
CJS 6125	Issues in National Security
CJS 6135	Intimate Partner Violence
CJS 6140	Security Role: Safety and Environment Protection
CJS 6145	Correctional Rehabilitation
CJS 6205	Law Enforcement Management and Planning
CJS 6300	Communities and Crime
CJS 6305	Criminal Behavior and the Family
CJS 6315	Administration of the Adult and Juvenile Correction Systems
CJS 6320	Community Corrections
CJS 6325	Probation and Parole
CJS 6330	Youth Justice and Crime
CJS 6340	Substance Abuse and Addictions
CJS 6420	U.S. Policing in the 21st Century
GST 6300	Security and Terrorism
LDR 6110	Leading Teams
LDR 6120	Organizational Leadership
LDR 6360	Dynamics of Change at the Community and Social Level
INT 6943	Integrative Experiential Learning

Concentration in Policing

Policing Courses		
Complete five of the following:		15
CJS 6035	Corruption, Integrity, and Accountability	
CJS 6045	Policing Issues around the Globe	
CJS 6050	Models of Intelligence-Led Policing	
CJS 6205	Law Enforcement Management and Planning	
CJS 6300	Communities and Crime	
CJS 6420	U.S. Policing in the 21st Century	
Elective		
Complete 3 quarter hours from the following:		3
CJS 6005	Legal and Regulatory Issues for Security Management	
CJS 6010	Advanced Principles of Security Management and Threat Assessment	
CJS 6025	Genocide and War Crimes	
CJS 6030	Organized Crime	
CJS 6035	Corruption, Integrity, and Accountability	
CJS 6040	Human Trafficking and Exploitation	
CJS 6045	Policing Issues around the Globe	
CJS 6050	Models of Intelligence-Led Policing	
CJS 6105	Domestic and International Terrorism	
CJS 6110	Management of Service Industries Security Department	
CJS 6120	Preventing Service Industries Losses	
CJS 6125	Issues in National Security	
CJS 6135	Intimate Partner Violence	
CJS 6140	Security Role: Safety and Environment Protection	
CJS 6145	Correctional Rehabilitation	
CJS 6205	Law Enforcement Management and Planning	
CJS 6300	Communities and Crime	
CJS 6305	Criminal Behavior and the Family	
CJS 6315	Administration of the Adult and Juvenile Correction Systems	
CJS 6320	Community Corrections	
CJS 6325	Probation and Parole	
CJS 6330	Youth Justice and Crime	
CJS 6340	Substance Abuse and Addictions	
CJS 6420	U.S. Policing in the 21st Century	
GST 6300	Security and Terrorism	
LDR 6110	Leading Teams	
LDR 6120	Organizational Leadership	
LDR 6140	Strategic Leadership	
LDR 6360	Dynamics of Change at the Community and Social Level	
INT 6943	Integrative Experiential Learning	

Concentration in Security

Security Courses		
Complete five of the following:		15-16
CJS 6010	Advanced Principles of Security Management and Threat Assessment	
CJS 6005	Legal and Regulatory Issues for Security Management	
CJS 6035	Corruption, Integrity, and Accountability	
CJS 6045	Policing Issues around the Globe	
CJS 6105	Domestic and International Terrorism	
CJS 6125	Issues in National Security	
GST 6300	Security and Terrorism	
Elective		
Complete 3 quarter hours from the following:		3
CJS 6005	Legal and Regulatory Issues for Security Management	
CJS 6010	Advanced Principles of Security Management and Threat Assessment	
CJS 6025	Genocide and War Crimes	
CJS 6030	Organized Crime	
CJS 6035	Corruption, Integrity, and Accountability	
CJS 6040	Human Trafficking and Exploitation	
CJS 6045	Policing Issues around the Globe	

CJS 6050	Models of Intelligence-Led Policing
CJS 6105	Domestic and International Terrorism
CJS 6110	Management of Service Industries Security Department
CJS 6120	Preventing Service Industries Losses
CJS 6125	Issues in National Security
CJS 6135	Intimate Partner Violence
CJS 6140	Security Role: Safety and Environment Protection
CJS 6145	Correctional Rehabilitation
CJS 6205	Law Enforcement Management and Planning
CJS 6300	Communities and Crime
CJS 6305	Criminal Behavior and the Family
CJS 6315	Administration of the Adult and Juvenile Correction Systems
CJS 6320	Community Corrections
CJS 6325	Probation and Parole
CJS 6330	Youth Justice and Crime
CJS 6340	Substance Abuse and Addictions
CJS 6420	U.S. Policing in the 21st Century
GST 6300	Security and Terrorism
LDR 6110	Leading Teams
LDR 6120	Organizational Leadership
LDR 6140	Strategic Leadership
LDR 6360	Dynamics of Change at the Community and Social Level
INT 6943	Integrative Experiential Learning

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Global Studies and International Relations, MS

Globalization has created a world of new opportunities for those savvy enough to recognize them and acquire the new skill sets needed for success in international government, consulting, business and industry, nonprofit, and educational sectors.

This program is designed to prepare students for internationally focused positions that range from traditional practitioners of diplomacy, to development workers, to executives employed in the dynamic world of international consultancy, trade, and industry. With courses enriched by classmates from every continent, students are active learners in a collaborative, cross-cultural setting from their very first course.

The core curriculum ensures all students have a solid grounding in foundational courses such as international politics, economics, security, and diplomacy. Students then select from a broad-based menu of concentrations, allowing them to develop specialties. The program culminates in a capstone experience in which students elect to write a thesis, engage in a case study, or undertake short-term travel to conduct intensive field research.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

GST 6100	Globalization and Global Politics and Economics	4
GST 6101	Global Literacy, Culture, and Community	4
GST 6109	Basic Field Research Methods	4
GST 6320	Peace and Conflict	4

Elective Course

Complete one of the following:		4
GST 6501	Regional Studies: East Asia	
GST 6502	Regional Studies: Middle East	
GST 6503	Regional Studies: Sub-Saharan Africa	
GST 6504	Regional Studies: Europe	
GST 6505	Regional Studies: Southwest and Central Asia	
GST 6506	Regional Studies: Latin America	

Capstone Course

Complete one of the following:		
GST 6920	Case Study in Global Studies	4
GST 7990	Thesis	1-8
INT 6900	International Field Study Experience	3

Electives

Complete 2–4 quarter hours from the following:		2-4
GST 6102	Global Corporate and Social Responsibility	
GST 6200	The Funders	
GST 6210	The Developers	
GST 6220	Globalization of Emerging Economies	
GST 6300	Security and Terrorism	
GST 6310	Immigration and Labor	
GST 6324	Divided Societies in the Modern World	
GST 6326	International Conflict and Cooperation	
GST 6327	Conflict and Postconflict Development	
GST 6340	Poverty and Wealth	
GST 6350	Global Economics of Food and Agriculture	
GST 6360	Nuclear Nonproliferation	
GST 6410	Global Education in the Internet Age	
GST 6430	Leadership and Management	
GST 6540	Politics of the European Union	
GST 6550	U.S. Foreign Policy	
GST 6580	Opportunities in International Consulting	
GST 6590	Public Diplomacy	
GST 6600	The Practice of Diplomacy	
GST 6610	Sustainable Development	
GST 6700	Global Health Perspectives, Politics, and Experiences in International Development	
GST 6710	Critical Issues and Challenges in the Practice of Global Health	
GST 6740	Human Rights	
GST 6810	International Higher Education	

GST 6820	Managing Study Abroad
GST 6830	Managing International Students
GST 6840	The Business of International Education
GST 6850	Immigration and Legal Issues in International Higher Education
GST 7983	Topics
COP 6940	Personal and Career Development
Enrollment into this course requires participation in the cooperative education program.	
INPS 5184	Interdisciplinary Professional Foundations
INT 6943	Integrative Experiential Learning

Concentrations

Complete one of the following five concentrations:

Concentration in Conflict Resolution

Complete five of the following:		20
GST 6324	Divided Societies in the Modern World	
GST 6326	International Conflict and Cooperation	
GST 6327	Conflict and Postconflict Development	
GST 6300	Security and Terrorism	
GST 6360	Nuclear Nonproliferation	
GST 6740	Human Rights	
One of five courses may be a global studies concentration course from the following:		
GST 6102	Global Corporate and Social Responsibility	
GST 6200	The Funders	
GST 6210	The Developers	
GST 6220	Globalization of Emerging Economies	
GST 6310	Immigration and Labor	
GST 6340	Poverty and Wealth	
GST 6350	Global Economics of Food and Agriculture	
GST 6410	Global Education in the Internet Age	
GST 6430	Leadership and Management	
GST 6360	Nuclear Nonproliferation	
GST 6501	Regional Studies: East Asia	
GST 6502	Regional Studies: Middle East	
GST 6503	Regional Studies: Sub-Saharan Africa	
GST 6504	Regional Studies: Europe	
GST 6505	Regional Studies: Southwest and Central Asia	
GST 6506	Regional Studies: Latin America	
GST 6540	Politics of the European Union	
GST 6550	U.S. Foreign Policy	
GST 6560	Multilateral Diplomacy	
GST 6580	Opportunities in International Consulting	
GST 6590	Public Diplomacy	
GST 6600	The Practice of Diplomacy	
GST 6610	Sustainable Development	
GST 6700	Global Health Perspectives, Politics, and Experiences in International Development	
GST 6710	Critical Issues and Challenges in the Practice of Global Health	
GST 6810	International Higher Education	
GST 6820	Managing Study Abroad	
GST 6830	Managing International Students	
GST 6840	The Business of International Education	
GST 6850	Immigration and Legal Issues in International Higher Education	

Concentration in Development Global Health

Complete five of the following:		20
GST 6210	The Developers	
GST 6340	Poverty and Wealth	
GST 6350	Global Economics of Food and Agriculture	
GST 6610	Sustainable Development	
GST 6700	Global Health Perspectives, Politics, and Experiences in International Development	
GST 6710	Critical Issues and Challenges in the Practice of Global Health	
One of five courses may be a global studies concentration course from the following:		
GST 6102	Global Corporate and Social Responsibility	
GST 6200	The Funders	
GST 6220	Globalization of Emerging Economies	
GST 6300	Security and Terrorism	
GST 6310	Immigration and Labor	
GST 6324	Divided Societies in the Modern World	
GST 6326	International Conflict and Cooperation	
GST 6327	Conflict and Postconflict Development	
GST 6360	Nuclear Nonproliferation	
GST 6410	Global Education in the Internet Age	
GST 6430	Leadership and Management	
GST 6501	Regional Studies: East Asia	
GST 6502	Regional Studies: Middle East	
GST 6503	Regional Studies: Sub-Saharan Africa	
GST 6504	Regional Studies: Europe	
GST 6505	Regional Studies: Southwest and Central Asia	
GST 6506	Regional Studies: Latin America	
GST 6540	Politics of the European Union	
GST 6550	U.S. Foreign Policy	
GST 6560	Multilateral Diplomacy	
GST 6580	Opportunities in International Consulting	
GST 6590	Public Diplomacy	
GST 6600	The Practice of Diplomacy	
GST 6740	Human Rights	
GST 6810	International Higher Education	
GST 6820	Managing Study Abroad	

GST 6830	Managing International Students
GST 6840	The Business of International Education
GST 6850	Immigration and Legal Issues in International Higher Education

Concentration in Diplomacy

Complete five of the following:		20
GST 6600	The Practice of Diplomacy	
GST 6540	Politics of the European Union	
GST 6550	U.S. Foreign Policy	
GST 6560	Multilateral Diplomacy	
GST 6590	Public Diplomacy	
GST 6740	Human Rights	
One of five courses may be a global studies concentration course from the following:		
GST 6102	Global Corporate and Social Responsibility	
GST 6200	The Funders	
GST 6210	The Developers	
GST 6220	Globalization of Emerging Economies	
GST 6300	Security and Terrorism	
GST 6310	Immigration and Labor	
GST 6324	Divided Societies in the Modern World	
GST 6326	International Conflict and Cooperation	
GST 6327	Conflict and Postconflict Development	
GST 6340	Poverty and Wealth	
GST 6350	Global Economics of Food and Agriculture	
GST 6360	Nuclear Nonproliferation	
GST 6410	Global Education in the Internet Age	
GST 6430	Leadership and Management	
GST 6501	Regional Studies: East Asia	
GST 6502	Regional Studies: Middle East	
GST 6503	Regional Studies: Sub-Saharan Africa	
GST 6504	Regional Studies: Europe	
GST 6505	Regional Studies: Southwest and Central Asia	
GST 6506	Regional Studies: Latin America	
GST 6580	Opportunities in International Consulting	
GST 6610	Sustainable Development	
GST 6700	Global Health Perspectives, Politics, and Experiences in International Development	
GST 6710	Critical Issues and Challenges in the Practice of Global Health	
GST 6810	International Higher Education	
GST 6820	Managing Study Abroad	
GST 6830	Managing International Students	
GST 6840	The Business of International Education	
GST 6850	Immigration and Legal Issues in International Higher Education	

Concentration in International Economics and Consulting

Complete five of the following:		20
GST 6580	Opportunities in International Consulting	
GST 6102	Global Corporate and Social Responsibility	
GST 6200	The Funders	
GST 6220	Globalization of Emerging Economies	
GST 6310	Immigration and Labor	
GST 6340	Poverty and Wealth	
GST 6430	Leadership and Management	
One of five courses may be a global studies concentration course from the following:		
GST 6210	The Developers	
GST 6300	Security and Terrorism	
GST 6324	Divided Societies in the Modern World	
GST 6326	International Conflict and Cooperation	
GST 6327	Conflict and Postconflict Development	
GST 6350	Global Economics of Food and Agriculture	
GST 6360	Nuclear Nonproliferation	
GST 6410	Global Education in the Internet Age	
GST 6501	Regional Studies: East Asia	
GST 6502	Regional Studies: Middle East	
GST 6503	Regional Studies: Sub-Saharan Africa	
GST 6504	Regional Studies: Europe	
GST 6505	Regional Studies: Southwest and Central Asia	
GST 6506	Regional Studies: Latin America	
GST 6540	Politics of the European Union	
GST 6550	U.S. Foreign Policy	
GST 6560	Multilateral Diplomacy	
GST 6590	Public Diplomacy	
GST 6600	The Practice of Diplomacy	
GST 6610	Sustainable Development	
GST 6700	Global Health Perspectives, Politics, and Experiences in International Development	
GST 6710	Critical Issues and Challenges in the Practice of Global Health	
GST 6740	Human Rights	
GST 6810	International Higher Education	
GST 6820	Managing Study Abroad	
GST 6830	Managing International Students	
GST 6840	The Business of International Education	
GST 6850	Immigration and Legal Issues in International Higher Education	

Concentration in Global Student Mobility

Complete five of the following:		20
GST 6810	International Higher Education	
GST 6820	Managing Study Abroad	
GST 6830	Managing International Students	
GST 6840	The Business of International Education	

GST 6850	Immigration and Legal Issues in International Higher Education
GST 6410	Global Education in the Internet Age

One of five courses may be a global studies concentration course from the following:

GST 6102	Global Corporate and Social Responsibility
GST 6200	The Funders
GST 6210	The Developers
GST 6220	Globalization of Emerging Economies
GST 6300	Security and Terrorism
GST 6310	Immigration and Labor
GST 6324	Divided Societies in the Modern World
GST 6326	International Conflict and Cooperation
GST 6327	Conflict and Postconflict Development
GST 6340	Poverty and Wealth
GST 6350	Global Economics of Food and Agriculture
GST 6360	Nuclear Nonproliferation
GST 6430	Leadership and Management
GST 6501	Regional Studies: East Asia
GST 6502	Regional Studies: Middle East
GST 6503	Regional Studies: Sub-Saharan Africa
GST 6504	Regional Studies: Europe
GST 6505	Regional Studies: Southwest and Central Asia
GST 6506	Regional Studies: Latin America
GST 6540	Politics of the European Union
GST 6550	U.S. Foreign Policy
GST 6560	Multilateral Diplomacy
GST 6580	Opportunities in International Consulting
GST 6590	Public Diplomacy
GST 6600	The Practice of Diplomacy
GST 6610	Sustainable Development
GST 6700	Global Health Perspectives, Politics, and Experiences in International Development
GST 6710	Critical Issues and Challenges in the Practice of Global Health
GST 6740	Human Rights

Program Credit/GPA Requirements

46 total quarter hours required
Minimum 3.000 GPA required

Human Services, MS

Professionals with graduate degrees in human services are needed to address a wide range of societal issues—whether by providing direct services, supervising personnel, or administering programs and policies. Often responsible for working with vulnerable populations, human services professionals must be adept at conducting assessments, developing service plans and policies, leading interdisciplinary teams, and managing care for at-risk clients.

To address this important need, the College of Professional Studies offers the online Master of Science in Human Services. In addition to a solid core curriculum, the program offers several electives, as well as concentrations in leadership, organizational communication, and global studies—enabling you to focus your graduate studies in the area that best matches your interests and career objectives. Reflecting Northeastern's philosophy of practice-oriented education, this human services master's degree includes work-based applications and a capstone service-learning project, offering you an opportunity to deepen your knowledge within your chosen specialty. This human services graduate degree program seeks to produce graduates with the knowledge and skills they need to pursue a leadership role in the fulfilling field of human services.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

HSV 6100	Theory and Practice of Human Services	3
HSV 6110	Human Services Management and Development	3
HSV 6120	Social Inequality, Social Change, and Community Building	3
HSV 6630	Research and Evaluation in Human Services	3
HSV 6640	Policy Issues in Human Services	3
HSV 6160	Introduction to Employee Assistance Programs	3
The following course should be taken last:		
HSV 6980	Capstone	1-4

Elective Courses

Complete three of the following:		9
NPM 6120	Financial Management for Nonprofit Organizations	
NPM 6130	Fund-Raising and Development for Nonprofit Organizations	
NPM 6140	Grant and Report Writing	
NPM 6150	Human Resources Management in Nonprofit Organizations	
CMN 6015	Introduction to the Digital Era: The Power of Social Media	
CMN 6080	Intercultural Communication	
INT 6943	Integrative Experiential Learning	

Concentrations

Complete one of the following three concentrations:

Concentration in Global Studies

Required Courses		
GST 6100	Globalization and Global Politics and Economics	4
GST 6101	Global Literacy, Culture, and Community	4
GST 6320	Peace and Conflict	4
Elective		
Complete one of the following:		4
GST 6501	Regional Studies: East Asia	

GST 6502	Regional Studies: Middle East	
GST 6503	Regional Studies: Sub-Saharan Africa	
GST 6504	Regional Studies: Europe	
GST 6505	Regional Studies: Southwest and Central Asia	
GST 6506	Regional Studies: Latin America	

Concentration in Leadership

Required Courses		
LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6150	Transforming Organizations	3
Choose one of the following courses:		3-6
LDR 6135	Ethical Leadership	
LDR 6140	Strategic Leadership	

Concentration in Organizational Communication

CMN 6000 and INT 6000	Introduction to Organizational Communication and Writing Lab	3-4
CMN 6020	Ethical Issues in Organizational Communication	3
CMN 6050	Crisis Communication	3
CMN 6090	Organizational Culture, Climate, and Communication	3
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	3

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Leadership, MS

As today's workforce continues to diversify, leadership tasks and responsibilities have become more complex. The Master of Science in Leadership seeks to prepare you to meet these evolving challenges by helping you cultivate a personal leadership philosophy. Leveraging students' interdisciplinary backgrounds, this master's degree in leadership combines real-world lessons with an action-learning approach that is designed to build and strengthen your leadership capabilities.

In September of 2009, the Master of Science in Leadership with a Concentration in Project Management received accreditation by the Project Management Institute's Global Accreditation Center (GAC), the world's leading association for project management professionals. Accreditation is achieved by meeting the GAC's rigorous standards, which include an assessment of program objectives and outcomes, a review of on-site and online resources, evaluations of faculty and students, and proof of continuous improvements in the area of project management.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6115	Leadership Communication	3
LDR 6120	Organizational Leadership	3-6
LDR 6135	Ethical Leadership	3
LDR 6140	Strategic Leadership	3-6
LDR 6145	Global Leadership	3
LDR 6150	Transforming Organizations	3
LDR 7980	Capstone	1-4

Required Elective Course

Complete one of the following:		3-4
CMN 6060	Negotiation, Mediation, and Facilitation	
COP 6940	Personal and Career Development	
INPS 5184	Interdisciplinary Professional Foundations	
INT 6943	Integrative Experiential Learning	
INT 6900	International Field Study Experience	

Concentration

Complete one of the following seven concentrations:

Concentration in Health Management

HMG 6110	Organization, Administration, Financing, and History of Healthcare	3
HMG 6130	Healthcare Strategic Management	3
HMG 6140	Principles of Population-Based Management	3
HMG 6160	Healthcare Information Systems Management	3
HMG 6170	Health Law, Politics, and Policy	3

Concentration in Human Resources

HRM 6005	Creating a High-Performance Organization: Strategic Organizational and HRM Choices	3
HRM 6010	Total Compensation	3
HRM 6020	Strategic Recruitment, Training, and Performance Management	3
HRM 6030	Employee Rights and Employer Obligations	3
HRM 6040	High-Performance Human Resources Systems and Development	3

Concentration in Leading and Managing Technical Projects

PJM 6000	Project Management Practices	3
PJM 6205	Leading and Managing Technical Projects	3
PJM 6210	Communication Skills for Project Managers	3
PJM 6215	Leading Remote Project Teams	3
PJM 6220	Planning and Scheduling Technical Projects	3

Concentration in Nonprofit Management

NPM 6110	Legal and Governance Issues in Nonprofit Organizations	3
NPM 6120	Financial Management for Nonprofit Organizations	3
NPM 6125	Promoting Nonprofit Organizations	3

NPM 6130	Fund-Raising and Development for Nonprofit Organizations	3
NPM 6140	Grant and Report Writing	3

Concentration in Organizational Communication

CMN 6000 and INT 6000	Introduction to Organizational Communication and Writing Lab	3-4
CMN 6020	Ethical Issues in Organizational Communication	3
CMN 6050	Crisis Communication	3
CMN 6090	Organizational Culture, Climate, and Communication	3
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	3

Concentration in Project Management

Project Management Courses		
Note: Students with project management experience are not required to take PJM 5900:		
PJM 5900	Foundations of Project Management	4
PJM 6000	Project Management Practices	3
PJM 6025	Project Scheduling and Cost Planning	3
PJM 6015	Project Risk Management	3
Project Management Electives		
Complete two of the following. Note: Students who take PJM 5900 are required to take only one course in this section:		6
PJM 6125	Project Evaluation and Assessment	
PJM 6135	Project Quality Management	
PJM 6140	Managing Troubled Projects	
PJM 6710	Introduction to Program and Portfolio Management	

Concentration in Sport and Social Change

LDR 6410	Leadership and Organization in Sport	3
GST 6102	Global Corporate and Social Responsibility	4
HSV 6120	Social Inequality, Social Change, and Community Building	3
LDR 6360	Dynamics of Change at the Community and Social Level	3
LDR 6427	Gender and Diversity in Sport	3

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Nonprofit Management, MS

Facing the threat of privatization and for-profit competition, nonprofit organizations are challenged to find leaders who not only possess keen business and managerial skills but can also effect change at a community or social level. Being successful in this dynamic and rewarding field requires strong leadership, managerial and interpersonal skills, as well as in-depth knowledge of fund-raising, marketing, program development, and governance issues.

Integrating theoretical approaches with practical applications, the Master of Science in Nonprofit Management seeks to prepare you for a leadership position in a not-for-profit university, hospital, charity, foundation, or religious organization. This nonprofit degree program seeks to produce graduates well-equipped to embark on a career in nonprofit management—prepared, and inspired, to make a meaningful impact.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

LDR 6100	Developing Your Leadership Capability	3-6
NPM 6110	Legal and Governance Issues in Nonprofit Organizations	3
NPM 6120	Financial Management for Nonprofit Organizations	3
NPM 6125	Promoting Nonprofit Organizations	3
NPM 6130	Fund-Raising and Development for Nonprofit Organizations	3
NPM 6140	Grant and Report Writing	3
NPM 6150	Human Resources Management in Nonprofit Organizations	3
NPM 6980	Capstone	3

Electives

Complete two of the following:		6-7
LDR 6110	Leading Teams	
LDR 6360	Dynamics of Change at the Community and Social Level	
CMN 6080	Intercultural Communication	
CMN 6050	Crisis Communication	
COP 6940	Personal and Career Development	
INPS 5184	Interdisciplinary Professional Foundations	
INT 6943	Integrative Experiential Learning	

Concentration

Complete one of the following seven concentrations:

Concentration in Global Studies

GST 6100	Globalization and Global Politics and Economics	4
GST 6101	Global Literacy, Culture, and Community	4
GST 6320	Peace and Conflict	4
Elective Course		
Complete one of the following:		4
GST 6501	Regional Studies: East Asia	
GST 6502	Regional Studies: Middle East	
GST 6503	Regional Studies: Sub-Saharan Africa	
GST 6504	Regional Studies: Europe	
GST 6505	Regional Studies: Southwest and Central Asia	
GST 6506	Regional Studies: Latin America	

Concentration in Human Services

HSV 6100	Theory and Practice of Human Services	3

HSV 6110	Human Services Management and Development	3
HSV 6630	Research and Evaluation in Human Services	3
HSV 6160	Introduction to Employee Assistance Programs	3
HSV 6640	Policy Issues in Human Services	3

Concentration in Leadership

LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6150	Transforming Organizations	3
Complete one of the following:		3-6
LDR 6135	Ethical Leadership	
LDR 6140	Strategic Leadership	

Concentration in Organizational Communication

CMN 6000 and INT 6000	Introduction to Organizational Communication and Writing Lab	3-4
CMN 6020	Ethical Issues in Organizational Communication	3
CMN 6050	Crisis Communication	3
CMN 6090	Organizational Culture, Climate, and Communication	3
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	3

Concentration in Project Management

Project Management Courses [1]		
PJM 5900	Foundations of Project Management	4
PJM 6000	Project Management Practices	3
PJM 6025	Project Scheduling and Cost Planning	3
PJM 6015	Project Risk Management	3
Project Management Electives		
Complete two of the following: [2]		6
PJM 6125	Project Evaluation and Assessment	
PJM 6135	Project Quality Management	
PJM 6140	Managing Troubled Projects	
PJM 6710	Introduction to Program and Portfolio Management	

1 Students with project management experience are not required to take Foundations of Project Management (PJM 5900).

2 Students who take Foundations of Project Management (PJM 5900) are required to take only one course in this section.

Concentration in Social Media and Online Communication

Complete five of the following:		15-17
CMN 6015	Introduction to the Digital Era: The Power of Social Media	
CMN 6025	Digital Era Skills: Platforms, Tools, and Techniques	
CMN 6035	Legal, Policy, and Ethical Issues in the Digital Era	
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	
CMN 6065	Implementation and Management of Social Media Channels and Online Communities	
DGM 6285	Interactive Marketing Fundamentals	
DGM 6290	Social Media and Brand Strategy Implementation	

Concentration in Sport and Social Change

LDR 6410	Leadership and Organization in Sport	3
GST 6102	Global Corporate and Social Responsibility	4
HSV 6120	Social Inequality, Social Change, and Community Building	3
LDR 6360	Dynamics of Change at the Community and Social Level	3
LDR 6427	Gender and Diversity in Sport	3

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Program and Portfolio Project Management, MS

The Master of Science in Program and Portfolio Project Management is intended to prepare project professionals for the more advanced-level roles in the organization. It provides a natural alignment to the professional advancement that exists within industry—from project manager to program manager to portfolio manager. Managing programs and portfolios successfully in any environment requires a unique set of interdisciplinary skills. This program seeks to bring together and train students in those skills that are most critical: program and portfolio management processes and tools, financial analysis, strategic and leadership skills, and communication skills and strategies. Advanced course work in program and project portfolio management will support project professionals in being prepared to focus on formulating strategies appropriate for changing market conditions, prioritizing and funding the appropriate initiatives and/or projects, successfully executing initiatives and/or projects in order to deliver strategic results, and using the lessons from unsuccessful strategy for strategy formulation.

The increasingly important role of program and project portfolio managers is becoming clear as companies orient more and more of their work in a projectized fashion. Another driving factor is better alignment of projects to the firm's strategy, doing the right projects to advance the organization. This has been made clear through the creation of advanced industry certifications, such as the Program Management Professional (PgMP®) and the Portfolio Management Professional (PfMP®) credential by the Project Management Institute. This Master of Science degree will prepare these individuals with the knowledge, skills, and tools needed to effectively manage project-based programs and portfolios.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

PJM 6000	Project Management Practices	3
PJM 6710	Introduction to Program and Portfolio Management	3
PJM 6715	Advanced Program Management	3
PJM 6720	Advanced Portfolio Management	3

PJM 6725	Program and Portfolio Leadership	3
PJM 6730	Program and Portfolio Evaluation	3
PJM 6740	Managing Program and Portfolio Risk and Complexity	3
RGA 6300	Practical Applications in Biomedical Product Global Regulatory Affairs	4
Complete two of the following:		6
PJM 6125	Project Evaluation and Assessment	
PJM 6140	Managing Troubled Projects	
PJM 6145	Global Project Management	
PJM 6705	Portfolio Management in the Enterprise Environment	

Required Electives

Complete two of the following:		6-7
CMN 6060	Negotiation, Mediation, and Facilitation	
CMN 6090	Organizational Culture, Climate, and Communication	
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	
LDR 6135	Ethical Leadership	
COP 6940	Personal and Career Development	
INT 6943	Integrative Experiential Learning	
INT 6940	Experiential Learning Projects for Professionals	

Students must choose one of the following concentrations:

LEADERSHIP

LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6150	Transforming Organizations	3
Complete one of the following:		3-6
LDR 6135	Ethical Leadership	
LDR 6140	Strategic Leadership	

ORGANIZATIONAL COMMUNICATION

CMN 6000	Introduction to Organizational Communication	2,3
INT 6000	Writing Lab	1
Complete four of the following:		12
CMN 6020	Ethical Issues in Organizational Communication	
CMN 6050	Crisis Communication	
CMN 6060	Negotiation, Mediation, and Facilitation	
CMN 6080	Intercultural Communication	
CMN 6090	Organizational Culture, Climate, and Communication	
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	

AGILE PROJECT MANAGEMENT

PJM 6810	Principles of Agile Project Management	3
PJM 6815	Advanced Agile Project Management	3
PJM 6820	Agile Implementation and Governance	3
PJM 6825	Agile Lean Product Development	3
Complete one of the following:		3
PJM 6205	Leading and Managing Technical Projects	
CMN 6060	Negotiation, Mediation, and Facilitation	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Project Management, MS

Companies succeed or fail based on their ability to bring quality products and services to market in a timely manner. Without skilled project managers in place, companies are challenged to deliver projects on time, on budget, and according to specifications. From inception to completion, project managers are responsible for every step in the process: project definition, cost and risk estimation, schedule planning and monitoring, budget management, negotiation and conflict resolution, project leadership, and project presentation and evaluation.

The Master of Science in Project Management is designed to provide you with the practical skills and theoretical concepts you need to lead complex projects. Featuring real-world case studies, this project management degree presents techniques and tools for managing long- and short-term projects successfully and cost-effectively. Augmenting the core project management courses are concentrations that seek to provide you with content-specific expertise that enables you to deepen your knowledge in your field of interest.

In September of 2009, the Master of Science in Project Management received accreditation by the Project Management Institute's Global Accreditation Center (GAC), the world's leading association for project management professionals. Accreditation is achieved by meeting the GAC's rigorous standards, which include an assessment of program objectives and outcomes, a review of on-site and online resources, evaluations of faculty and students, and proof of continuous improvements in the area of project management.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

Note: Foundations of Project Management (PJM 5900) must be completed *before* taking Project Management Practices (PJM 6000) for students who do not have at least three years of professional experience directing or leading project tasks. This course is highly recommended for students who do not have a basic working knowledge of Microsoft Project software. Students with project management experience are not required to take Foundations of Project Management (PJM 5900):

PJM 5900	Foundations of Project Management	4
PJM 6000	Project Management Practices	3
PJM 6005	Project Scope Management	3
PJM 6015	Project Risk Management	3
PJM 6025	Project Scheduling and Cost Planning	3
PJM 6135	Project Quality Management	3
The following course should be taken last:		
PJM 6910	Capstone	3

Project Management Required Electives

Complete two of the following. Note: Students who take PJM 5900 are required to take only one course in this section:	6

PJM 6125	Project Evaluation and Assessment	
PJM 6140	Managing Troubled Projects	
PJM 6145	Global Project Management	
PJM 6710	Introduction to Program and Portfolio Management	

Electives

Complete two of the following:		5-6
CMN 6000	Introduction to Organizational Communication	
CMN 6060	Negotiation, Mediation, and Facilitation	
CMN 6090	Organizational Culture, Climate, and Communication	
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	
COP 6940	Personal and Career Development	
INPS 5184	Interdisciplinary Professional Foundations	
INT 6943	Integrative Experiential Learning	
INT 6940	Experiential Learning Projects for Professionals	
PJM 6205	Leading and Managing Technical Projects	
PJM 6210	Communication Skills for Project Managers	
PJM 6215	Leading Remote Project Teams	

Concentrations

Complete one of the following nine concentrations:

Concentration in Clinical Trial Design

Complete one of the following:		
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs	4
BTC 6210	Human Experimentation: Methodological Issues Fundamentals	4
Required Courses		
BTC 6211	Validation and Auditing of Clinical Trial Information	4
BTC 6213	Clinical Trial Design Optimization and Problem Solving	4
PMC 6212	Clinical Drug Development Data Analysis: Concepts	4

Concentration in Construction Management

CMG 6400	Introduction to Construction Management	4
CMG 6402	Alternative Project Delivery Methods and Project Controls	4
CMG 6403	Safety, Project Risk, and Quality Management	4
CMG 6405	Construction Law	4

Concentration in Geographic Information Systems

GIS 5101	Introduction to Geographic Information Systems	3
GIS 5102	Fundamentals of GIS Analysis	3
RMS 5105	Fundamentals of Remote Sensing	3
GIS 5201	Advanced Spatial Analysis	3
Elective		
Complete one of the following:		3
GIS 6340	GIS Customization	
GIS 6350	Planning a GIS Implementation	
GIS 6370	Internet-Based GIS	
GIS 6360	Spatial Databases	

Concentration in Information Security Management

ITC 6300	Foundations of Information Security	3
ITC 6315	Information Security Risk Management	3
ITC 6310	Information Security Governance	3
ITC 6320	Information Security Technology	3
Elective		
Complete one of the following:		3
ITC 6020	Information Systems Design and Development	
ITC 6305	IT Infrastructure (Systems, Networks, Telecom)	
ITC 6335	Data Warehousing and Data Mining	
ITC 6345	Systems and Network Administration	

Concentration in Leadership

LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6150	Transforming Organizations	3
Elective		
Complete one of the following:		3-6
LDR 6135	Ethical Leadership	
LDR 6140	Strategic Leadership	

Concentration in Leading and Managing Technical Projects

PJM 6205	Leading and Managing Technical Projects	3
PJM 6210	Communication Skills for Project Managers	3
PJM 6215	Leading Remote Project Teams	3
PJM 6220	Planning and Scheduling Technical Projects	3
ITC 6035	Information Technology Project Management	3

Concentration in Organizational Communication

CMN 6000 and INT 6000	Introduction to Organizational Communication and Writing Lab	3-4
Electives		
Complete four of the following:		12
CMN 6020	Ethical Issues in Organizational Communication	
CMN 6050	Crisis Communication	
CMN 6060	Negotiation, Mediation, and Facilitation	
CMN 6080	Intercultural Communication	
CMN 6090	Organizational Culture, Climate, and Communication	

CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	

Concentration in Agile Project Management

Students in this concentration will only have one required elective course:		
PJM 6810	Principles of Agile Project Management	3
PJM 6815	Advanced Agile Project Management	3
PJM 6820	Agile Implementation and Governance	3
PJM 6205	Leading and Managing Technical Projects	3
CMN 6060	Negotiation, Mediation, and Facilitation	3

Concentration in Program and Portfolio Management

Students in this concentration will only have one required elective course:		
PJM 6710	Introduction to Program and Portfolio Management	3
PJM 6715	Advanced Program Management	3
PJM 6720	Advanced Portfolio Management	3
PJM 6725	Program and Portfolio Leadership	3
PJM 6730	Program and Portfolio Evaluation	3
PJM 6735	Program and Portfolio Management Capstone	3

Program Credit/GPA Requirements

45–48 total quarter hours required
Minimum 3.000 GPA required

Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Clinical Research Regulatory Affairs, MS

The rapid growth of the biomedical product industries and the ever-evolving regulatory landscape have driven high demand for trained regulatory affairs professionals in both the public and private sectors. In response to this demand, Northeastern University's College of Professional Studies offers the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

This unique graduate degree is designed to both broaden and deepen the student's understanding of current regulations and their practical application in the development of biomedical products. Courses within this program provide students with the opportunity to integrate both scientific knowledge and regulatory perspectives, within the larger context of global commercialization. From discovery through the postmarket phase of product development, this master's degree covers the regulatory and market access requirements to bring a medical product to—and maintain its presence in—the global marketplace.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RGA 6101	Therapeutic Product Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
RGA 6207	FDA and the Electronic Common Technical Document (eCTD)	4
BTC 6210	Human Experimentation: Methodological Issues Fundamentals	4
BTC 6213	Clinical Trial Design Optimization and Problem Solving	4
RGA 6300	Practical Applications in Biomedical Product Global Regulatory Affairs	4

Required Electives

Students must earn a minimum of 16 quarter hours by choosing at least one course from each elective category.

REGULATORY AND CLINICAL OPERATIONS

Complete at least one of the following:		3-4
BTC 6211	Validation and Auditing of Clinical Trial Information	
RGA 6000	Introduction to Food and Drug Administration (FDA) Pharmaceutical Regulation	
RGA 6001	Introduction to Food and Drug Administration Medical Device Regulation	
RGA 6208		
RGA 6212	Introduction to Safety Sciences	
RGA 6230	Clinical Laboratory Management in Clinical Trials	
RGA 6310	Regulatory Documentation Processes	
RGA 6280	Advanced Writing on International Biomedical Topics	

REGULATORY PERSPECTIVE: PRODUCT DEVELOPMENT, BUSINESS, AND STRATEGY

Complete at least one of the following:		2-4
BTC 6260	The Business of Medicine and Biotechnology	
RGA 6235	Emerging Product Categories in the Regulation of Drugs and Biologics	
RGA 6217	Biomedical Product Development: From Biotech to Boardroom to Market	
RGA 6215	Project Management in Early Drug Discovery and Development	
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs	
RGA 6245	Regulation of Generic Pharmaceutical and Biosimilar Products	
RGA 6250	Financing and Reimbursement in Biomedical Product Development	
RGA 6211	Combination Products and Convergence	
COP 6940	Personal and Career Development (Enrollment in COP 6940 requires participation in the cooperative education program [subject to availability.] Students must complete two of the following four courses prior to enrolling in COP 6940: RGA 6100, RGA 6201, RGA 6202, or BTC 6210.)	
INPS 5184	Interdisciplinary Professional Foundations	

or EDU 6184	Interdisciplinary Foundations	
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection	

INTERNATIONAL

Complete at least one of the following: 4-5

RGA 6228	Managing International Clinical Trials	
RGA 6220	Global Biotechnology Product Registration: E.U., U.S. Product Regulation	
RGA 6221	European Union Compliance Process and Regulatory Affairs	
RGA 6223	Introduction to Canadian, Asian, and Latin American Regulatory Affairs	
RGA 6224	Regulation of Biomedical Product Commercialization by Health Canada	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in General Regulatory Affairs, MS

The rapid growth of the biomedical product industries and the ever-evolving regulatory landscape have driven high demand for trained regulatory affairs professionals in both the public and private sectors. In response to this demand, Northeastern University's College of Professional Studies offers the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

This unique graduate degree is designed to both broaden and deepen the student's understanding of current regulations and their practical application in the development of biomedical products. Courses within this program provide students with the opportunity to integrate both scientific knowledge and regulatory perspectives, within the larger context of global commercialization. From discovery through the postmarket phase of product development, this master's degree covers the regulatory and market access requirements to bring a medical product to—and maintain its presence in—the global marketplace.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RGA 6000	Introduction to Food and Drug Administration (FDA) Pharmaceutical Regulation	2
RGA 6001	Introduction to Food and Drug Administration Medical Device Regulation	2
BTC 6210	Human Experimentation: Methodological Issues Fundamentals	4
RGA 6101	Therapeutic Product Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
RGA 6207	FDA and the Electronic Common Technical Document (eCTD)	4
RGA 6300	Practical Applications in Biomedical Product Global Regulatory Affairs	4

Required Electives

Students must earn a minimum of 16 quarter hours by choosing at least one course from each category.

REGULATORY AND CLINICAL OPERATIONS

Complete at least one of the following: 3-4

BTC 6211	Validation and Auditing of Clinical Trial Information	
BTC 6213	Clinical Trial Design Optimization and Problem Solving	
RGA 6208		
RGA 6212	Introduction to Safety Sciences	
RGA 6230	Clinical Laboratory Management in Clinical Trials	
RGA 6280	Advanced Writing on International Biomedical Topics	
RGA 6310	Regulatory Documentation Processes	
RGA 6370	Regulatory Writing: Medical Device Submissions	
RGA 6380	Regulatory Writing: New Drug Applications	
RGA 6233	Application of Quality System Regulation in Medical Device Design and Manufacturing	
RGA 6234	Drug and Device Supplier Risk Management: Compliance and Processes	

REGULATORY PERSPECTIVE: PRODUCT DEVELOPMENT, BUSINESS, AND STRATEGY

Complete at least one of the following: 2-4

BTC 6260	The Business of Medicine and Biotechnology	
RGA 6215	Project Management in Early Drug Discovery and Development	
RGA 6216	The Medical, Social, and Financial Dimensions of Orphan Drugs	
RGA 6217	Biomedical Product Development: From Biotech to Boardroom to Market	
RGA 6219	The Advertising and Promotion of Drug and Medical Device Products	
PMC 6212	Clinical Drug Development Data Analysis: Concepts	
RGA 6112	Biomedical Intellectual Property Management: Patents	
RGA 6205	Emerging Trends and Issues in the Medical Device Industry	
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs	
RGA 6211	Combination Products and Convergence	
RGA 6245	Regulation of Generic Pharmaceutical and Biosimilar Products	

RGA 6250	Financing and Reimbursement in Biomedical Product Development
COP 6940	Personal and Career Development (Enrollment in COP 6940 requires participation in the cooperative education program [subject to availability.] Students must complete two of the following four courses prior to enrolling in COP 6940: RGA 6100, RGA 6201, RGA 6202, or BTC 6210.)
INPS 5184	Interdisciplinary Professional Foundations
or EDU 6184	Interdisciplinary Foundations
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection

INTERNATIONAL

Complete at least one of the following: 4-5

RGA 6220	Global Biotechnology Product Registration: E.U., U.S. Product Regulation
RGA 6221	European Union Compliance Process and Regulatory Affairs
RGA 6222	European Medical Device Regulations
RGA 6223	Introduction to Canadian, Asian, and Latin American Regulatory Affairs
RGA 6224	Regulation of Biomedical Product Commercialization by Health Canada
RGA 6225	Japanese Medical Device Regulations and Registration
RGA 6226	Canadian and Australian Medical Device Regulations
RGA 6227	Emerging Medical Device Markets
RGA 6228	Managing International Clinical Trials

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in International Regulatory Affairs, MS

The rapid growth of the biomedical product industries and the ever-evolving regulatory landscape have driven high demand for trained regulatory affairs professionals in both the public and private sectors. In response to this demand, Northeastern University's College of Professional Studies offers the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

This unique graduate degree is designed to both broaden and deepen the student's understanding of current regulations and their practical application in the development of biomedical products. Courses within this program provide students with the opportunity to integrate both scientific knowledge and regulatory perspectives, within the larger context of global commercialization. From discovery through the postmarket phase of product development, this master's degree covers the regulatory and market access requirements to bring a medical product to—and maintain its presence in—the global marketplace.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RGA 6000	Introduction to Food and Drug Administration (FDA) Pharmaceutical Regulation	2
RGA 6001	Introduction to Food and Drug Administration Medical Device Regulation	2
RGA 6101	Therapeutic Product Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6207	FDA and the Electronic Common Technical Document (eCTD)	4
RGA 6220	Global Biotechnology Product Registration: E.U., U.S. Product Regulation	5
RGA 6223	Introduction to Canadian, Asian, and Latin American Regulatory Affairs	4
RGA 6300	Practical Applications in Biomedical Product Global Regulatory Affairs	4

Required Electives

Students must earn a minimum of 16 quarter hours by choosing at least one course from each elective category.

REGULATORY AND CLINICAL OPERATIONS

Complete at least one of the following: 3-4

BTC 6211	Validation and Auditing of Clinical Trial Information
BTC 6213	Clinical Trial Design Optimization and Problem Solving
RGA 6208	
RGA 6212	Introduction to Safety Sciences
RGA 6370	Regulatory Writing: Medical Device Submissions
RGA 6380	Regulatory Writing: New Drug Applications
RGA 6280	Advanced Writing on International Biomedical Topics

REGULATORY PERSPECTIVE

Complete at least one of the following: 2-5

RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases
BTC 6260	The Business of Medicine and Biotechnology
RGA 6217	Biomedical Product Development: From Biotech to Boardroom to Market
RGA 6235	Emerging Product Categories in the Regulation of Drugs and Biologics
RGA 6205	Emerging Trends and Issues in the Medical Device Industry
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs

RGA 6245	Regulation of Generic Pharmaceutical and Biosimilar Products
RGA 6211	Combination Products and Convergence
COP 6940	Personal and Career Development (Enrollment in COP 6940 requires participation in the cooperative education program (subject to availability). Students must complete two of the following four courses prior to enrolling in COP 6940: RGA 6100, RGA 6201, RGA 6202, or BTC 6210.)
INPS 5184	Interdisciplinary Professional Foundations
or EDU 6184	Interdisciplinary Foundations
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection

INTERNATIONAL

Complete at least one of the following: 4

RGA 6221	European Union Compliance Process and Regulatory Affairs
RGA 6222	European Medical Device Regulations
RGA 6224	Regulation of Biomedical Product Commercialization by Health Canada
RGA 6225	Japanese Medical Device Regulations and Registration
RGA 6226	Canadian and Australian Medical Device Regulations
RGA 6227	Emerging Medical Device Markets
RGA 6228	Managing International Clinical Trials
RGA 6229	Biomedical Product Regulatory Affairs in Emerging Markets: Russia and Kazakhstan
RGA 6211	Combination Products and Convergence

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Operational Regulatory Affairs, MS

The rapid growth of the biomedical product industries and the ever-evolving regulatory landscape have driven high demand for trained regulatory affairs professionals in both the public and private sectors. In response to this demand, Northeastern University's College of Professional Studies offers the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

This unique graduate degree is designed to both broaden and deepen the student's understanding of current regulations and their practical application in the development of biomedical products. Courses within this program provide students with the opportunity to integrate both scientific knowledge and regulatory perspectives, within the larger context of global commercialization. From discovery through the postmarket phase of product development, this master's degree covers the regulatory and market access requirements to bring a medical product to—and maintain its presence in—the global marketplace.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RGA 6000	Introduction to Food and Drug Administration (FDA) Pharmaceutical Regulation	2
RGA 6001	Introduction to Food and Drug Administration Medical Device Regulation	2
RGA 6101	Therapeutic Product Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
RGA 6207	FDA and the Electronic Common Technical Document (eCTD)	4
RGA 6208		
RGA 6370	Regulatory Writing: Medical Device Submissions	4
RGA 6380	Regulatory Writing: New Drug Applications	4
RGA 6300	Practical Applications in Biomedical Product Global Regulatory Affairs	4

Required Electives

Students must earn a minimum of 8 quarter hours by choosing at least two courses from the lists below.

REGULATORY AND CLINICAL OPERATIONS

RGA 6280	Advanced Writing on International Biomedical Topics
RGA 6310	Regulatory Documentation Processes
RGA 6212	Introduction to Safety Sciences
BTC 6211	Validation and Auditing of Clinical Trial Information
BTC 6210	Human Experimentation: Methodological Issues Fundamentals

REGULATORY PERSPECTIVE: PRODUCT DEVELOPMENT, BUSINESS, AND STRATEGY

BTC 6260	The Business of Medicine and Biotechnology
RGA 6235	Emerging Product Categories in the Regulation of Drugs and Biologics
RGA 6205	Emerging Trends and Issues in the Medical Device Industry
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs
RGA 6245	Regulation of Generic Pharmaceutical and Biosimilar Products
RGA 6211	Combination Products and Convergence
RGA 6112	Biomedical Intellectual Property Management: Patents

COP 6940	Personal and Career Development (Enrollment in COP 6940 requires participation in the cooperative education program [subject to availability.] Students must complete two of the following four courses prior to enrolling in COP 6940: RGA 6100, RGA 6201, RGA 6202, or BTC 6210.)
INPS 5184	Interdisciplinary Professional Foundations
or EDU 6184	Interdisciplinary Foundations
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection

INTERNATIONAL

RGA 6220	Global Biotechnology Product Registration: E.U., U.S. Product Regulation
RGA 6221	European Union Compliance Process and Regulatory Affairs
RGA 6222	European Medical Device Regulations
RGA 6224	Regulation of Biomedical Product Commercialization by Health Canada
RGA 6223	Introduction to Canadian, Asian, and Latin American Regulatory Affairs
RGA 6225	Japanese Medical Device Regulations and Registration
RGA 6226	Canadian and Australian Medical Device Regulations

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Regulatory Compliance, MS

The rapid growth of the biomedical product industries and the ever-evolving regulatory landscape have driven high demand for trained regulatory affairs professionals in both the public and private sectors. In response to this demand, Northeastern University's College of Professional Studies offers the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

This unique graduate degree is designed to both broaden and deepen the student's understanding of current regulations and their practical application in the development of biomedical products. Courses within this program provide students with the opportunity to integrate both scientific knowledge and regulatory perspectives, within the larger context of global commercialization. From discovery through the postmarket phase of product development, this master's degree covers the regulatory and market access requirements to bring a medical product to—and maintain its presence in—the global marketplace.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RGA 6000	Introduction to Food and Drug Administration (FDA) Pharmaceutical Regulation	2
RGA 6001	Introduction to Food and Drug Administration Medical Device Regulation	2
RGA 6101	Therapeutic Product Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
RGA 6207	FDA and the Electronic Common Technical Document (eCTD)	4
RGA 6300	Practical Applications in Biomedical Product Global Regulatory Affairs	4

Required Electives

Students must earn a minimum of 20 quarter hours by choosing at least one course from each elective category.

REGULATORY AND CLINICAL OPERATIONS

Complete at least one of the following:		4
RGA 6212	Introduction to Safety Sciences	
RGA 6208		
BTC 6213	Clinical Trial Design Optimization and Problem Solving	
BTC 6211	Validation and Auditing of Clinical Trial Information	
RGA 6230	Clinical Laboratory Management in Clinical Trials	
RGA 6234	Drug and Device Supplier Risk Management: Compliance and Processes	
RGA 6280	Advanced Writing on International Biomedical Topics	

REGULATORY PERSPECTIVE: PRODUCT DEVELOPMENT, BUSINESS, AND STRATEGY

Complete at least one of the following:		2-4
BTC 6260	The Business of Medicine and Biotechnology	
RGA 6217	Biomedical Product Development: From Biotech to Boardroom to Market	
RGA 6235	Emerging Product Categories in the Regulation of Drugs and Biologics	
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs	
RGA 6245	Regulation of Generic Pharmaceutical and Biosimilar Products	
RGA 6205	Emerging Trends and Issues in the Medical Device Industry	
RGA 6211	Combination Products and Convergence	

COP 6940	Personal and Career Development (Enrollment in COP 6940 requires participation in the cooperative education program [subject to availability.] Students must complete two of the following four courses prior to enrolling in COP 6940: RGA 6100, RGA 6201, RGA 6202, or BTC 6210.)	
INPS 5184	Interdisciplinary Professional Foundations	
or EDU 6184	Interdisciplinary Foundations	
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection	

INTERNATIONAL

Complete at least one of the following: 4

RGA 6221	European Union Compliance Process and Regulatory Affairs	
RGA 6222	European Medical Device Regulations	
RGA 6223	Introduction to Canadian, Asian, and Latin American Regulatory Affairs	
RGA 6224	Regulation of Biomedical Product Commercialization by Health Canada	
RGA 6225	Japanese Medical Device Regulations and Registration	
RGA 6226	Canadian and Australian Medical Device Regulations	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Strategic Regulatory Affairs, MS

The rapid growth of the biomedical product industries and the ever-evolving regulatory landscape have driven high demand for trained regulatory affairs professionals in both the public and private sectors. In response to this demand, Northeastern University's College of Professional Studies offers the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

This unique graduate degree is designed to both broaden and deepen the student's understanding of current regulations and their practical application in the development of biomedical products. Courses within this program provide students with the opportunity to integrate both scientific knowledge and regulatory perspectives, within the larger context of global commercialization. From discovery through the postmarket phase of product development, this master's degree covers the regulatory and market access requirements to bring a medical product to—and maintain its presence in—the global marketplace.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RGA 6201	New Drug Development: A Regulatory Overview	4
RGA 6101	Therapeutic Product Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
RGA 6207	FDA and the Electronic Common Technical Document (eCTD)	4
RGA 6217	Biomedical Product Development: From Biotech to Boardroom to Market	4
RGA 6300	Practical Applications in Biomedical Product Global Regulatory Affairs	4

Required Electives

Students must earn a minimum of 20 quarter hours by choosing at least one course from each elective category.

REGULATORY AND CLINICAL OPERATIONS

Complete one of the following: 4

RGA 6280	Advanced Writing on International Biomedical Topics	
RGA 6208		
RGA 6212	Introduction to Safety Sciences	
BTC 6211	Validation and Auditing of Clinical Trial Information	
BTC 6213	Clinical Trial Design Optimization and Problem Solving	
BTC 6210	Human Experimentation: Methodological Issues Fundamentals	

REGULATORY PERSPECTIVE: PRODUCT DEVELOPMENT, BUSINESS, AND STRATEGY

Complete one of the following: 2-4

BTC 6260	The Business of Medicine and Biotechnology	
RGA 6216	The Medical, Social, and Financial Dimensions of Orphan Drugs	
RGA 6235	Emerging Product Categories in the Regulation of Drugs and Biologics	
RGA 6112	Biomedical Intellectual Property Management: Patents	
RGA 6205	Emerging Trends and Issues in the Medical Device Industry	
RGA 6245	Regulation of Generic Pharmaceutical and Biosimilar Products	
RGA 6250	Financing and Reimbursement in Biomedical Product Development	
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs	
RGA 6211	Combination Products and Convergence	
COP 6940	Personal and Career Development (Enrollment in COP 6940 requires participation in the cooperative education program [subject to availability.] Students must complete two of the following four courses prior to enrolling in COP 6940: RGA 6100, RGA 6201, RGA 6202, or BTC 6210.)	
INPS 5184	Interdisciplinary Professional Foundations	
or EDU 6184	Interdisciplinary Foundations	

INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection

INTERNATIONAL

Complete one of the following: 4-5

RGA 6220	Global Biotechnology Product Registration: E.U., U.S. Product Regulation
RGA 6221	European Union Compliance Process and Regulatory Affairs
RGA 6222	European Medical Device Regulations
RGA 6223	Introduction to Canadian, Asian, and Latin American Regulatory Affairs
RGA 6224	Regulation of Biomedical Product Commercialization by Health Canada
RGA 6225	Japanese Medical Device Regulations and Registration
RGA 6226	Canadian and Australian Medical Device Regulations
RGA 6227	Emerging Medical Device Markets

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Regulatory Affairs of Food and Food Industries, MS

The Master of Science in Regulatory Affairs of Food and Food Industries is designed to offer a combination of theory and practical training for professionals looking to enter into, or advance in, the field of food regulatory affairs.

Our courses and curriculum are cross disciplinary, covering topics and methods that lie at the intersection of the life sciences, agricultural planning, food science, nutrition, law, economics, international relations, and regulatory policy. The breadth of the curriculum provides students from various educational and employment backgrounds with the opportunity to contribute to an evolving market.

Successful graduates of the program will gain the necessary knowledge and requisite skills to serve as leaders in the domain of food regulatory affairs. They will be equipped to serve instrumental roles in the formation of public policies, the implementation of regulatory guidelines, industry's compliance with regulations, and the regulatory strategies of companies looking to create a sustainable competitive advantage in the food industry.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RFA 6100	Introduction to Regulatory Affairs of Food and Food Industries	3
RFA 6110	From Farm to Family Table: Understanding the Food Regulatory Life Cycle	3
RFA 6120	Economic and Social Aspects of Food	3
RFA 6130	Food Law in the United States	3
RFA 6200	Comparing U.S. Regulatory Systems and Agencies	3
RFA 6220	Food Safety and Surveillance: Concepts and Applications	3
RFA 6225	Introduction to Food Science	3
RFA 6235	Regulatory Differences and Similarities: An International Investigation	3
RFA 6300	Capstone: Regulatory Affairs of Food	3

Elective Courses

REGULATORY PROCESSES

Complete two of the following: 8

RFA 6205	Key Submissions for Food Regulatory Affairs
RFA 6210	Food Safety and Modernization
RFA 6215	Risk Analysis and Hazard Analysis in the Food Industry
RFA 6230	The Scientific, Social, and Commercial Aspects of Genetically Modified Foods

BUSINESS AND MARKETING

Note: Personal and Career Development (COP 6940) or Integrative Experiential Learning (INT 6943) may only count toward one of the business and marketing elective courses. Enrollment in either of these courses requires participation in the cooperative education program (http://www.cps.neu.edu/degree-programs/internships-co-ops) (subject to availability).

Complete two of the following: 4-8

RFA 6310	Food Across International Borders: The International Food Trade
RFA 6315	From Farm to Dinner Table: The Industrialization and Commercialization of Food
RFA 6350	Political, Social, and Economic Influences on Food Law, Regulation, and Policy
NTR 6155	Nutrition Entrepreneurship
NTR 6165	Food and Society
COP 6940	Personal and Career Development
INT 6943	Integrative Experiential Learning

INTERNATIONAL FOOD REGULATIONS

Complete two of the following: 8

RFA 6410	Landmark Changes in International Food Policy
RFA 6411	International Surveillance and Regulation of Food
RFA 6430	Food Safety and Commercialization in Emerging Economies
GST 6350	Global Economics of Food and Agriculture

Program Credit/GPA Requirements

48–56 total quarter hours required
Minimum 3.000 GPA required

Respiratory Care Leadership, MS

Emerging environmental issues, recent technological advances, and a growing elderly population are escalating the need for skilled respiratory therapists. To be successful, today's respiratory care leaders must

be skilled educators, practitioners, and case managers. In response, Northeastern University's College of Professional Studies has developed the Master of Science in Respiratory Care Leadership.

Created for practicing respiratory therapists, this master's degree in respiratory care incorporates an action-learning approach that seeks to build leadership competencies and to advance your clinical knowledge. Core respiratory care courses cover areas such as advanced cardiopulmonary physiology and research design. In addition, you have the opportunity to focus your studies in one of four concentrations: adult and organizational learning, clinical trial design, health management, and respiratory specialty practice.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Respiratory Care Courses

RPT 7200	Advanced Cardiopulmonary Physiology	3
RPT 7205	The Evolving Roles of Respiratory Care Professionals	3
RPT 7210	Research Design	4
RPT 7215	Applied Research in Respiratory Care	3
RPT 7300	Development of Clinical Practice Guidelines and Respiratory Care Protocols	4
RPT 7302	Respiratory Therapist Education	4

Required Leadership Courses

Complete two of the following:		6-12
LDR 6100	Developing Your Leadership Capability	
LDR 6110	Leading Teams	
LDR 6135	Ethical Leadership	
LDR 6140	Strategic Leadership	

Concentration

Complete one of the following four concentrations:

Concentration in Adult and Organizational Learning

Complete four of the following:		16
EDU 6051	Culture, Equity, Power, and Influence	
EDU 6201	The Landscape of Higher Education	
EDU 6202	Faculty, Curriculum, and Academic Community	
EDU 6221	Enrollment, Retention, Graduation, Success	
EDU 6319	How People Learn	
EDU 6323	Technology as a Medium for Learning	
EDU 6447	The Demographics of Higher Education	

Concentration in Clinical Trial Design

Complete four of the following:		16
BTC 6210	Human Experimentation: Methodological Issues Fundamentals	
BTC 6211	Validation and Auditing of Clinical Trial Information	
BTC 6213	Clinical Trial Design Optimization and Problem Solving	
BTC 6260	The Business of Medicine and Biotechnology	
RGA 6100	Introduction to Drug and Medical Device Regulation	
RGA 6202	Medical Device Development: A Regulatory Overview	
RGA 6205	Emerging Trends and Issues in the Medical Device Industry	

Concentration in Health Management

Complete five of the following:		15
HMG 6110	Organization, Administration, Financing, and History of Healthcare	
HMG 6120	Human Resource Management in Healthcare	
HMG 6130	Healthcare Strategic Management	
HMG 6140	Principles of Population-Based Management	
HMG 6160	Healthcare Information Systems Management	
HMG 6170	Health Law, Politics, and Policy	
NPM 6120	Financial Management for Nonprofit Organizations	
NPM 6125	Promoting Nonprofit Organizations	
NPM 6130	Fund-Raising and Development for Nonprofit Organizations	

Concentration in Respiratory Specialty Practice

RPT 7400	Pulmonary Diseases and Disorders	4
RPT 7401	Cardiopulmonary Assessment and Diagnostics	4
Complete two of the following:		8
RPT 7402	Adult Critical Care	
RPT 7403	Neonatal and Pediatric Care	
RPT 7404	Pulmonary Wellness Education and Coordination	
RPT 7405	Development of Patient Management Plans	

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Technical Communication, MS

A proliferation of new technologies and applications has heightened the call for professionals who can communicate complex technical ideas succinctly and articulately. In response, Northeastern University's College of Professional Studies offers the Master of Science in Technical Communication.

This online master's degree is designed to improve your technical communication skills and to provide you with a foundation for applying those skills across a variety of contexts. With three concentrations from which to choose—computer industry writing, social media and online communities, or usability/user experience—this graduate degree in technical communication seeks to prepare you for a rewarding career as a technical writer, editor, tool expert, or technical trainer.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

TCC 6100	Introduction to Technical and Professional Writing	4
TCC 6102	Editing Technical Content	4
TCC 6110	Information Architecture	4
TCC 6120	Usability and User Experience	4
The following course should be taken last:		
TCC 6850	Technical Communications Capstone Project	4

Concentration

If students prefer to focus their studies on a particular concentration, they may select 16–18 quarter hours from one of the concentrations below and complement their studies with 8–10 quarter hours of elective courses (listed at the end of the curriculum) to meet the minimum 46-quarter-hour degree requirement.

Students are not required to complete a concentration. Any combination of 26 quarter hours from concentration and elective courses will satisfy degree requirements.

Concentration in Computer Industry Writing

Complete four of the following:		16
TCC 6430	Writing for the Computer Industry	
TCC 6440	Advanced Writing for the Computer Industry	
TCC 6400	Structured Documentation	
TCC 6450	Managing Technical Publications	
TCC 6410	Online Documentation	

Concentration in Social Media and Online Communities

Required Course		
TCC 6710	Content Strategy	4
Complete 12–14 quarter hours from the following:		12-14
CMN 6035	Legal, Policy, and Ethical Issues in the Digital Era	
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	
CMN 6065	Implementation and Management of Social Media Channels and Online Communities	
DGM 6285	Interactive Marketing Fundamentals	
DGM 6290	Social Media and Brand Strategy Implementation	

Concentration in Usability/User Experience

Choose any combination of the following courses to complete 16 quarter hours:		16
TCC 6710	Content Strategy	
TCC 6470	Web Accessibility for Technical Communicators	
DGM 6268	Usable Design for Mobile Digital Media	
TCC 6610	Prototyping	
TCC 6620	Collecting User Data	
TCC 6420	Information Design for the Web	

Open Electives

Choose a combination of 8–10 quarter hours of electives from the list below and any concentration courses above:		8-10
TCC 6480	Instructional Design for Technical Communicators	
TCC 6630	Introduction to XML	
TCC 6640	Wiki-Based Documentation	
TCC 6495	Document Design	
TCC 6150	Writing Portfolio	

Program Credit/GPA Requirements

46 total quarter hours required
Minimum 3.000 GPA required

Sports Leadership, MSLD

The practice-oriented sports leadership master's degree is structured to accommodate midcareer athletic administrators and coaches, as well as individuals seeking to prepare for careers in the sports industry.

Developed in collaboration with Northeastern University's Center for the Study of Sport in Society, the Master of Sports Leadership seeks to prepare you for a variety of sport-related occupations—whether it's working with a professional or intercollegiate sports team; with a fitness club or wellness organization; or in marketing, communication, or sports management. Courses within this unique graduate degree examine the social and business issues that are critical to sports leadership. Offered in an online format with an intensive one-week summer institute in Boston, this practice-oriented degree seeks to provide you with a well-rounded educational experience, equipping you to advance your career in the sports industry.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

Note: Sport in Society (LDR 6405) and Sports Media Relations (LDR 6441) are summer institute courses, available on-campus in Boston. Winter institute course available on campus in Charlotte, North Carolina.

LDR 6100	Developing Your Leadership Capability	3-6
LDR 6135	Ethical Leadership	3
LDR 6405	Sport in Society	3
LDR 6410	Leadership and Organization in Sport	3
LDR 6430	Sports Law	3
LDR 6441	Sports Media Relations	3

Complete one of the following. This course should be the last course taken and requires faculty advisor approval:		1-4
LDR 6961	Internship	
LDR 6980	Capstone	

Elective Courses

Choose two of the following:		18
CMN 6015	Introduction to the Digital Era: The Power of Social Media	
LDR 6443	Ticket Sales and Strategies	

LDR 6470	Bystander Strategies for the Prevention of Gender-Based Violence
INT 6943	Integrative Experiential Learning

Concentration

Professional Sports Administration

LDR 6323	Event Management	3
LDR 6400	Sports Management	3
LDR 6435	Fiscal Practices in Sports	3
LDR 6440	Sports Marketing and Promotions	3
LDR 6445	Corporate Sponsorships	3
LDR 6460	Risk Management in Athletics	3

Collegiate Athletics Administration

LDR 6400	Sports Management	3
LDR 6427	Gender and Diversity in Sport	3
LDR 6442	Athletic Fund-Raising	3
LDR 6455	NCAA Compliance	3
LDR 6465	Title IX	3
LDR 6615	Academic Advising for Student-Athletes	3

Program Credit/GPA Requirements

45 total quarter hours required
Minimum 3.000 GPA required

Graduate Certificate Programs

Enhance your skills and career potential with a graduate certificate from Northeastern University's College of Professional Studies. We offer over 355 certificates that represent fast-growing fields such as education, project management, leadership, and technology. **Courses are delivered online**, **on campus**, or in a **blended format**, offering you maximum flexibility and convenience for your busy schedule.

Programs

- 3-D Animation (p. 322)
- Adult and Organizational Learning (p. 323)
- Advanced Study in Orthopedics (p. 323)
- Agile Project Management (p. 323)
- Biopharmaceutical (p. 326)Domestic (p. 326) Regulatory Affairs (p. 326)
- Cloud Computing Application and Management (p. 324)
- Collegiate Athletics Administration (p. 324)
- Construction Management (p. 324)
- Cross-Cultural Communication (p. 325)
- Digital Media Management (p. 325)
- Digital Video (p. 325)
- E-Learning and Instructional Design (p. 326)
- Financial Markets and Institutions (p. 327)
- Forensic Accounting (p. 327)
- Game Design (p. 327)
- Geographic Information Systems (p. 327)
- Global Student Mobility (p. 328)
- Global Studies and International Relations (p. 328)
- Health Management (p. 329)
- Higher Education Administration (p. 329)
- Human-Centered Informatics (p. 330)
- Human Resources Management (p. 330)
- Information Security Management (p. 330)
- Interactive Design (p. 331)
- Interdisciplinary Professional Studies (p. 331)
- International Biopharmaceutical Regulatory Affairs (p. 332)
- Leadership (p. 333)
- Leading and Managing Technical Projects (p. 333)
- Leading Communication Strategy and Talent Development (p. 333)
- Learning Analytics (p. 334)
- Medical Devices Regulatory Affairs (p. 334)
- Nonprofit Management (p. 335)
- Organizational Communication (p. 335)
- Port Security (p. 335)
- Professional Sports Administration (p. 336)
- Program and Portfolio Management (p. 336)
- Project Management (p. 336)
- Public and Media Relations (p. 337)
- Remote Sensing (p. 337)
- Respiratory Specialty Practice (p. 338)
- Social Media and Online Communities (p. 338)
- Teaching English to Speakers Of Other Languages (p. 338)

3-D Animation, Graduate Certificate

Three-D animation is not only a major component in the film and broadcast industries, it is also a crucial element in online entertainment and a driving force for the gaming industry. Companies use animation in advertisements, websites, and training programs. The growing use of gaming technologies in education and industry (often referred to as Serious Games) has given rise to a need for skilled animators who can work closely with business and academic institutions.

The Graduate Certificate in 3D Animation offers a practice-oriented approach to the art and science of animation, with a particular emphasis on the special requirements of 3D modeling and animating for the gaming industry. Course work is designed to develop students' powers of visualization as well as provide a conceptual basis for visual narrative. The program seeks to produce graduates who are skilled in the use of industry-standard animation applications; understand visual principles of lighting, modeling, and surfacing; and are conversant with motion and special effects compositing.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Course

Complete one of the following. Note: For students with a portfolio waiver, DGM 6450 is the core course:		*4*
DGM 6105	Visual Communications Foundation	
DGM 6450	Animation Basics	

Required Courses

DGM 6122	Foundations of Digital Storytelling	4
DGM 6510	3-D Modeling	4
DGM 6530	Character Animation	4
DGM 6540	Compositing	4

DGM 6882	Animation Reel	1-4

Program Credit/GPA Requirements

22 total quarter hours required
Minimum 3.000 GPA required

Adult and Organizational Learning, Graduate Certificate

From globalization to technology, economic volatility to talent management, there is an increasing need to educate today's workforce for competitive advantage. To meet these needs, trainers, executive development professionals, human resource managers, and educators must stay current in adult and organizational learning.

The Graduate Certificate in Adult and Organizational Learning is designed to provide participants with foundational knowledge in adult learning, needs assessment, and program review. Students have an opportunity to gain expertise and understanding of the methods and models available for instruction, delivery channels, and overall program development.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

EDU 6319	How People Learn	4
EDU 6323	Technology as a Medium for Learning	4
Complete one of the following:		4
EDU 6324	Competencies, Assessment, and Learning Analytics	
EDU 6437	Assessment in Education	
Complete one of the following:		4
EDU 6331	E-Learning Design as a Collaborative Profession	
EDU 6450	The Globalization of Education	

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Advanced Study In Orthopedics, Graduate Certificate

The Northeastern University Graduate Certificate in Advanced Study of Orthopedics is designed for licensed physical therapists interested in developing advanced skills in orthopedic physical therapy. This program will consist of five courses (18 credits) and be taught 100 percent online. The online design of the program will provide practicing physical therapists the flexibility to adapt to their demanding schedules, save time on travel, and complete the program from the comfort of their homes. The program can be completed in 18 to 36 months with fall, winter, and summer start dates. The online format will foster the development of critical reflective thinking through case studies and discussions focusing on the most current information in orthopedic physical therapy.

Program Objectives:

- Prepare physical therapists to integrate the current research into their orthopedic clinical practice
- Apply knowledge of the anatomy and biomechanics to the evaluation and treatment of the musculoskeletal system
- Interpret and analyze medical and physical examination findings based on the Patient/Client Management Model
- Analyze current surgical interventions for the musculoskeletal system as it applies to physical therapy care
- Provide the student with the knowledge and skills required to sit for the American Physical Therapy Association's Board of Physical Therapy Specialist Orthopaedic clinical specialization examination

Note: Contact Eric Folmar, program director, for further information: e.folmar@neu.edu (e.folmar@neu.edu?subject=CPS Website Inquiry) or 617.304.9253.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

PTH 6560	Patient Management Models and Evidence-Based Practice in Orthopedics	2
PTH 6561	Evidence-Based Examination and Outcomes for the Cervical-Thoracic Spine and Temporomandibular Joint	4
PTH 6562	Evidence-Based Examination and Outcomes for Upper Extremity: Shoulder, Elbow, and Hand	4
PTH 6563	Evidence-Based Examination and Outcomes for Lumbar Spine and Sacroiliac Joint	4
PTH 6564	Evidence-Based Examination and Outcomes for Lower Extremity: Hip, Knee, Foot, and Ankle	4

An optional two-and-a-half-day hands-on lab that will include components of each of the courses (upper extremity, lower extremity, spine) will be offered each spring. People enrolled in the program will have the option to take the hands-on labs for an extra fee.

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Agile Project Management, Graduate Certificate

Northeastern University's graduate certificate in agile is designed to empower students to explore agile principles and practice and remain up-to-date with current trends in the agile framework. The increasingly important role of agile practitioners and managers is becoming clear as agile business development processes are being adopted by major companies because of its high degree of success in achieving improved time to market, reducing costs, and increasing overall customer satisfaction.

The graduate certificate in agile is led by highly credentialed faculty members that are agile practitioners with decades of experience in helping companies successfully implement agile in their organizations.

Through courses you take online, our agile graduate certificate project management curriculum will give you the opportunity to:

- Develop a strong framework and understanding of the role of agile management

- Develop an understanding of the agile management processes and methodologies
- Develop an understanding of how an agile approach to managing projects can deliver value to the organization
- Develop a personal leadership strategy for success as an agile practitioner
- Develop an agile evaluation plan to measure success

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

PJM 6810	Principles of Agile Project Management	3
PJM 6815	Advanced Agile Project Management	3
PJM 6820	Agile Implementation and Governance	3
PJM 6825	Agile Lean Product Development	3
PJM 6205	Leading and Managing Technical Projects	3
CMN 6060	Negotiation, Mediation, and Facilitation	3

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Cloud Computing Application and Management, Graduate Certificate

Cloud computing is the delivery of computing services over the internet. Due to the relatively lower cost of IT solutions, many organizations have started to take advantage of cloud services provided by Amazon Web Services, Microsoft Azure, IBM Cloud and Softlayer, Google Cloud Platform, Salesforce, and so on. These web service providers offer a broad range of global cloud-based IT products, including computing technologies, storage, databases, analytics, networking, mobile, developer tools, management tools, Internet of Things connectivity, and security and enterprise applications. These services can help organizations move faster, facilitate agile development, and better manage scalability.

The cloud computing application and management (CCA&M) graduate certificate offers students an opportunity to develop technical and management skills to address the needs of enterprise IT services. They will study theoretical and practical aspects of distributed systems from both technical and business perspectives. Successful students will be able to identify frameworks, techniques, and existing IT solutions to manage internet services at different levels (infrastructure, platform, and software). Students in the CCA&M graduate certificate program will also be able to demonstrate the ability to use APIs to integrate applications and business operations into the cloud. They can be directly employed by web service providers or instead work as IT solutions managers in organizations that contract with web service providers.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

ITC 6420	Introduction to Cloud Computing Applications and Management	3
ITC 6430	Enterprise Information Technology Service Management	3
ITC 6015	Enterprise Information Architecture	3
ITC 6320	Information Security Technology	3
ITC 6355	Web Application Design and Development	3
Complete three of the following:		10-12
ALY 6050	Introduction to Enterprise Analytics	
PJM 6205	Leading and Managing Technical Projects	
DGM 6145	Information Technology and Creative Practice	
MIS 6080	Network Security Concepts	
MIS 6082	Network Protection	

Program Credit/GPA Requirements

25 total quarter hours required
Minimum 3.000 GPA required

Collegiate Athletics Administration, Graduate Certificate

College athletics in the United States is comprised of more than 1,200 schools, conferences, and organizations that collectively invest in the well-being of student-athletes—both on and off the field.

The Graduate Certificate in Collegiate Athletics Administration offers students an opportunity to obtain an in-depth understanding of the largest amateur segment of the sports industry. Through the program's curriculum, students will be given the opportunity to acquire leadership skills and knowledge in a variety of collegiate athletics topics including sports management, NCAA compliance, fund-raising, academic advising, gender and diversity in sport, and Title IX legislation.

Upon completion, all credits earned in the collegiate athletics administration certificate can also be applied directly into the Master of Sports Leadership (p. 321) program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

LDR 6400	Sports Management	3
LDR 6427	Gender and Diversity in Sport	3
LDR 6442	Athletic Fund-Raising	3
LDR 6455	NCAA Compliance	3
LDR 6465	Title IX	3
LDR 6615	Academic Advising for Student-Athletes	3

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Construction Management, Graduate Certificate

Over the last two decades, construction in both the public and private sector has become increasingly complex, requiring construction and project managers to have a stronger skill base to be successful in acquiring and executing projects.

The Graduate Certificate in Construction Management is intended to serve owners' representatives, consulting engineers, architects, design engineers, contractors, and subcontractors. Individuals who have a bachelor's degree, but not necessarily in construction, and who have been identified by their companies as having high potential for advancement are also good candidates for this program.

Courses from this certificate may be applied toward the Master of Science in Project Management.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

CMG 6400	Introduction to Construction Management	4
CMG 6402	Alternative Project Delivery Methods and Project Controls	4
CMG 6403	Safety, Project Risk, and Quality Management	4
CMG 6405	Construction Law	4

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Cross-Cultural Communication, Graduate Certificate

The Graduate Certificate in Cross-Cultural Communication will help to equip professionals with the knowledge and competencies to:

- Analyze personal cross-cultural awareness and implicit bias, in addition to interpret organizational cross-cultural communication strategy to develop effective communication processes and activities
- Evaluate communication audiences from a holistic perspective, thereby constructing effective verbal and nonverbal interactions based on cross-cultural consumption
- Formulate enlightened cross-cultural communication and inclusive diversity strategies, processes, and policies
- Demonstrate critical thinking skills through research, case analysis, role-plays, and experiential learning demonstrating agility, quick response, and diplomacy employing cross-cultural communication strategies

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

CMN 6082		
CMN 6085	Strategies for Cross-Cultural Facilitation and Negotiation	3

Required Electives

Students must earn a minimum of 12 quarter hours.

SOCIAL JUSTICE TRACK

PBR 6100	Introduction to Public Relations	3
HSV 6120	Social Inequality, Social Change, and Community Building	3
ITC 6045	Information Technology Policy, Ethics, and Social Responsibility	3
HRM 6040	High-Performance Human Resources Systems and Development	3

INTERNATIONAL TRACK

GST 6100	Globalization and Global Politics and Economics	4
GST 6101	Global Literacy, Culture, and Community	4
LDR 6145	Global Leadership	3
HRM 6040	High-Performance Human Resources Systems and Development	3

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Digital Media Management, Graduate Certificate

The digital media market space can present unexpected challenges to standard business models. The Graduate Certificate in Digital Media Management offers courses designed to help managers apply best business practices to these nontraditional challenges. Students are offered the opportunity to gain skills in managing functionally diverse digital media teams, responding effectively to response-critical projects, and implementing marketing strategy in a variety of media channels.

Courses in the program were selected by faculty from the College of Professional Studies' Master of Professional Studies in Digital Media. The certificate consists of one core course selected from the MPS in Digital Media (p. 293) curriculum combined with existing concentration courses.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

DGM 6145	Information Technology and Creative Practice	4
DGM 6279	Project Management for Digital Media	4
DGM 6280	Managing for Digital Media	4
DGM 6285	Interactive Marketing Fundamentals	4

Electives

Complete one of the following:		4
DGM 6230	Digital Media Entrepreneurship	
DGM 6290	Social Media and Brand Strategy Implementation	

Program Credit/GPA Requirements

20 total quarter hours required
Minimum 3.000 GPA required

Digital Video, Graduate Certificate

With the quality and ease of use of digital video camcorders, anyone can capture moving images, but the result is like a Stradivarius violin: It takes training to make music. The Graduate Certificate in Digital Video

is a hands-on introduction to digital video technologies, as well as an examination of the social, cultural, and political implications of moving-image production in the digital age. Students have an opportunity to gain competency in digital production and postproduction while exploring various formal, conceptual, and structural strategies. Students will also have an opportunity to learn to generate digital video that communicates effectively and inventively, in preparation for positions in the creative industries of gaming, design, and media production.

The courses in this program also serve as a concentration in the Master of Professional Studies in Digital Media.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

DGM 6105	Visual Communications Foundation	4
DGM 6122	Foundations of Digital Storytelling	4
DGM 6880	Portfolio	2

Electives

Complete two of the following:		8
DGM 6435	Digital Video Production	
DGM 6440	Editing in the Digital Studio	
DGM 6520	Lighting for the Camera	

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Biopharmaceutical Domestic Regulatory Affairs, Graduate Certificate

The biotechnology and pharmaceutical industries continue to experience rapid growth in the U.S. market. As companies in these industries seek approval to market their products in the United States, demand for qualified regulatory affairs professionals continues to increase. Product development scientists, marketers, quality personnel, as well as legal experts that guide companies through the Food and Drug Administration (FDA) approval process, will benefit from regulatory affairs training.

The Graduate Certificate in Biopharmaceutical Domestic Regulatory Affairs is designed to provide students with a greater understanding of U.S. biologic and pharmaceutical product regulation and their unique development, marketing, manufacturing, and postmarket approval-related issues. The program also seeks to prepare students to ensure regulatory compliance, proper validation, and utilization of proper quantitative measurement techniques. Courses from this certificate may be applied toward the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RGA 6000	Introduction to Food and Drug Administration (FDA) Pharmaceutical Regulation	2
RGA 6001	Introduction to Food and Drug Administration Medical Device Regulation	2
RGA 6101	Therapeutic Product Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
Complete one of the following:		4-5
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs	
RGA 6211	Combination Products and Convergence	
RGA 6212	Introduction to Safety Sciences	
RGA 6214		
RGA 6216	The Medical, Social, and Financial Dimensions of Orphan Drugs	
RGA 6217	Biomedical Product Development: From Biotech to Boardroom to Market	
RGA 6370	Regulatory Writing: Medical Device Submissions	
RGA 6380	Regulatory Writing: New Drug Applications	

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

e-Learning and Instructional Design, Graduate Certificate

The e-learning and instructional design certificate increases opportunities for professional diversification and advancement as the contemporary landscape of learning increasingly requires a digital component. This curriculum is designed to prepare professionals to design pedagogically sound online, blended, and technology-enhanced educational experiences from stand-alone workshops to program suites.

Certificate participants investigate the latest research on the science of learning, draw on research-based principles to design engaging online and mobile environments, and become prepared to respond innovatively to societal and institutional changes that impact the field of online and mobile education.

Students will have the option of applying their four courses toward the e-learning and instructional design MEd program if they decide to pursue that degree.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

EDU 6319	How People Learn	4
EDU 6321	Models for Learning Design	4
EDU 6323	Technology as a Medium for Learning	4

Elective

Complete one of the following:		4

EDU 6324	Competencies, Assessment, and Learning Analytics
EDU 6331	E-Learning Design as a Collaborative Profession
EDU 6332	Open Learning
EDU 6333	Social Media and Beyond

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Financial Markets and Institutions, Graduate Certificate

In this rapidly changing business environment, the barriers between institutions are eroding, and competition is increasing due to deregulation and new product development. Managing internal operations more efficiently and adapting to the changing external environment is critical to the long-term survival of institutions. The Graduate Certificate in Financial Markets and Institutions seeks to prepare students to measure the impact of accounting decisions on performance; to manage risks, assets, and liabilities to meet corporate goals; to understand domestic and international financial systems and the institutions within them; and to build financial relationships that foster marketing financial products.

An examination of financial services industry principles and practices seeks to provide individuals working in brokerage houses, investment or commercial banks, insurance companies, or real estate with a greater understanding of financial systems as well as how to manage risks, assets, and liabilities in meeting corporate goals.

Note: Courses from this certificate may not be applied toward the Master of Science in Leadership.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

FIN 6101	Accounting Fundamentals for Financial Institutions	3-4
FIN 6161	Investment Analysis	4
FIN 6102	Asset and Liability Management	3-4
FIN 6120	Building Financial Relationships	3-4

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Forensic Accounting, Graduate Certificate

News surrounding corporate corruption has had a significant impact on businesses, particularly the accounting industry. In response, the government has enacted sweeping accounting and business laws such as the Sarbanes-Oxley 2002 legislation. Additionally, many professional organizations, including the American Institute of Certified Public Accountants (AICPA) and the Association of Certified Fraud Examiners (ACFE), have made the prevention, detection, and prosecution of fraud and accounting abuse a priority.

This four-course graduate certificate in forensic accounting is designed to help students apply techniques in identifying, collecting, and examining evidence, including how to identify financial statement misrepresentation, transaction reconstruction, and tax evasion.

Note: Courses from this certificate may not be applied toward the Master of Science in Leadership.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

Courses should be taken in the following sequence:

ACC 6210	Forensic Accounting Principles	4
ACC 6220	Dissecting Financial Statements	4
ACC 6230	Investigative Accounting and Fraud Examination	4
ACC 6240	Litigation Support	4

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Game Design, Graduate Certificate

Game design is one of the fastest-growing fields in entertainment, business, and education. From healthcare to political science, companies use games to educate their constituents and enhance employee skills.

The Graduate Certificate in Game Design offers a practice-oriented approach to the art and science of game making. The program emphasizes visual design and programming for video games and fosters conceptual understanding of the principles of game design for all varieties of games—from educational board games to iPhone games.

Courses in this program also serve as a concentration in the Master of Professional Studies in Digital Media.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

DGM 6308	Intermediate Programming for Digital Media	4
DGM 6400	Game Design Fundamentals	4
DGM 6405	Game Development	4
DGM 6408	Game Design Algorithms and Data Structures	4
DGM 6410	Game Design Technology Lab	4

Program Credit/GPA Requirements

20 total quarter hours required
Minimum 3.000 GPA required

Geographic Information Systems, Graduate Certificate

A geographic information system (GIS) combines layers of data to give needed information on specific locations. Such a system can map environmental sensitivities or geological features or can report on how

best to speed emergency personnel to an accident or crime scene. Current fields using GIS include healthcare, public safety, environmental management, transportation and operations technology, real estate, and public utilities.

The Graduate Certificate in Geographic Information Systems program offers hands-on training, seeking to give students the necessary skills and understanding to apply GIS competently and effectively. As a result of the certificate curriculum, students should be well versed in GIS theory, have practical hands-on exposure to GIS software and hardware, understand the representation of data in both mapped and tabular forms, and know how to plan and construct spatial databases.

The courses in this certificate program may be applied to the Master of Professional Studies in Geographic Information Technology.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

GIS 5101	Introduction to Geographic Information Systems	3
GIS 5102	Fundamentals of GIS Analysis	3
RMS 5105	Fundamentals of Remote Sensing	3
GIS 5201	Advanced Spatial Analysis	3

Electives

Complete two of the following:		6
GIS 6320	Use and Applications of Free and Open-Source GIS Desktop Software	
GIS 6340	GIS Customization	
GIS 6350	Planning a GIS Implementation	
GIS 6360	Spatial Databases	
GIS 6370	Internet-Based GIS	
GIS 6385	GIS/Cartography	
GIS 6390	Business Applications of Geographic Information Systems	
GIS 6391	Healthcare Applications of Geographic Information Systems	
GIS 6394	Crisis Mapping for Humanitarian Action	
GIS 6395	Geospatial Analysis of Crime	
GIS 6396	GIS for Defense, Homeland Security, and Emergency Response	

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Global Student Mobility, Graduate Certificate

The Graduate Certificate in Global Student Mobility offers an in-depth look at the dynamic field of international higher education for those wishing to administer programs for domestic and/or international students, faculty, and institutions. Students will receive a grounding in cross-cultural theories while also exploring the widening range of program types, methods of delivery, and the importance of experiential and service-learning exchanges. Courses explore U.S.–government-sponsored programs, the role of nongovernmental organizations (NGOs) dedicated to international academic exchanges, and the fast-growing world of third-party providers. Taught by practitioners with real-world experience, students will have ample opportunity to review case studies illustrating both challenges and innovative practices in this essential and highly specialized area of higher education.

The continual expansion of globalization has changed the landscape of higher education worldwide and fueled the demand for professionals with the skills and knowledge to enter this increasingly specialized field. The graduate certificate is designed to prepare students for employment in various sectors of the international education field including:

- Study abroad
- International student and scholar services
- International admissions and recruitment
- The development and administration of international study, work, and volunteer exchange
- Student ESL and language programs
- The complex range of U.S.–government-sponsored international exchange programs such as Fulbright, Humphrey, Muskie, YES, and scores of others
- NGOs supporting these exchanges such as IIE, Amideast, American Councils, and many others
- Creating and administering exchange programs for working professionals outside of higher education, targeting religious, philanthropic, and thematic programs

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

GST 6810	International Higher Education	4
GST 6820	Managing Study Abroad	4
GST 6830	Managing International Students	4

Elective

Complete one of the following:		4
GST 6101	Global Literacy, Culture, and Community	
INT 6900	International Field Study Experience (Requires co-registration in a 1 q.h. directed study. Students interested in taking INT 6900 should contact their Academic Advisor.)	

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Global Studies and International Relations, Graduate Certificate

The Graduate Certificate in Global Studies and International Relations is designed to provide students with the skills and training necessary to analyze, research, and evaluate a topic of interest in a global location. Overall, the program curriculum focuses on the themes of transition and development in the global world. Core courses provide a base of knowledge about global issues and are combined with an elective that allows students to focus on a specific area of interest.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

GST 6100	Globalization and Global Politics and Economics	4
GST 6101	Global Literacy, Culture, and Community	4
GST 6320	Peace and Conflict	4

Elective

Complete one of the following:		4
GST 6501	Regional Studies: East Asia	
GST 6502	Regional Studies: Middle East	
GST 6503	Regional Studies: Sub-Saharan Africa	
GST 6504	Regional Studies: Europe	
GST 6505	Regional Studies: Southwest and Central Asia	
GST 6506	Regional Studies: Latin America	

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Health Management, Graduate Certificate

Projections for the healthcare industry state that job growth will remain above average into the next decade. The needs of an aging population along with the increased human life cycle are just some of the factors contributing to this growth.

The Graduate Certificate in Health Management examines the financial, political, legal, and operational aspects of a healthcare facility and explores the evolution of healthcare delivery in the United States.

Health managers are found in different roles across healthcare organizations including:

- Strategic planning
- Operations
- Human resources
- Fund-raising
- Purchasing

Health managers are responsible for designing, administering, managing, and evaluating health policies, programs, and services. The courses in this certificate also serve as a concentration in the Master of Science in Leadership program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

HMG 6110	Organization, Administration, Financing, and History of Healthcare	3
HMG 6120	Human Resource Management in Healthcare	3
NPM 6120	Financial Management for Nonprofit Organizations	3
HMG 6130	Healthcare Strategic Management	3

Elective Courses

Complete two of the following (minimum of 6 quarter hours):		6
NPM 6110	Legal and Governance Issues in Nonprofit Organizations	
NPM 6150	Human Resources Management in Nonprofit Organizations	
HMG 6140	Principles of Population-Based Management	
HMG 6150	Seminar in Health Services Research: Issues and Research	
HMG 6160	Healthcare Information Systems Management	
HMG 6170	Health Law, Politics, and Policy	
HRM 6020	Strategic Recruitment, Training, and Performance Management	

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Higher Education Administration, Graduate Certificate

The effective administration of higher education institutions has never been as critical as at this time. Consider:

- The president of the United States of America and the secretary of education are calling for access to higher education for all
- European and Asian universities are ascending in quality, increasing as market forces
- The electronic delivery of education is escalating, creating new pedagogy and delivery models

To meet these challenges, as well as changing demographics, financial concerns, and legal and policy requirements, administrators and leaders in higher education need to be increasingly sophisticated and knowledgeable.

The Graduate Certificate in Higher Education Administration is designed to provide participants with an overall understanding of managerial concepts as well as the operational and strategic concepts that lead to effective administration. This program is best suited for individuals seeking mid- to senior-level administrative roles and individuals interested in transitioning from industry and other organizations into academia.

The certificate is comprised of 16 quarter hours, which may be applied toward the Master of Education in Higher Education Administration.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

EDU 6201	The Landscape of Higher Education	4
EDU 6202	Faculty, Curriculum, and Academic Community	4

EDU 6203	Education Law, Policy, and Finance	4

Elective

Complete one of the following:		4
EDU 6520	Learning and the Brain: Translating Research into Practice	
EDU 6319	How People Learn	
EDU 6332	Open Learning	
EDU 6330	Digital Media Literacy	
EDU 6558	Issues in Education	

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Human-Centered Informatics, Graduate Certificate

Human-centered informatics (HCI) focuses on the design, development, and evaluation of IT systems with a particular emphasis on the relations and interactions between people and IT systems. The emphasis of understanding users experience when they interact with technology in the information-rich environment and the design of interfaces between users and systems makes it different from the focus of software engineering programs or visual and artistic design programs.

The human-centered informatics graduate certificate offers students the opportunity to learn the theories of cognitive and social psychology as well as universal principles of design adopted in human-computer interaction. Students develop the technical skills to study user experience in various IT environments (home, business, social media, healthcare, etc.), focusing on user needs, information architecture, and design of user interfaces. Successful students that graduate with the HCI graduate certificate will be able to propose innovative or improve design solutions to real-world problems.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

ITC 6410	Fundamentals of Human Behaviors for Interactive Systems	3
DGM 6461	Interactive Information Design 1	4
DGM 6168	Usability and Human Interaction	4
DGM 6268	Usable Design for Mobile Digital Media	4
Complete three of the following:		9-12
DGM 6463	Interactive Information Design 2	
DGM 6525	Research Methods for Global User Experiences	
ALY 6070	Communication and Visualization for Data Analytics	
ITC 6355	Web Application Design and Development	
ITC 7120	Healthcare Information Systems	
DGM 6145	Information Technology and Creative Practice	
GIS 6370	Internet-Based GIS	

Program Credit/GPA Requirements

25 total quarter hours required
Minimum 3.000 GPA required

Human Resources Management, Graduate Certificate

In today's multifaceted organizations, human resource professionals must respond to the growing challenges of regulatory compliance, complex benefit plans, and training and motivating employees.

The Graduate Certificate in Human Resources Management seeks to foster a deep understanding of organizational development and effective change management, workforce planning and strategic recruitment, and training and performance management.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

HRM 6005	Creating a High-Performance Organization: Strategic Organizational and HRM Choices	3
HRM 6010	Total Compensation	3
HRM 6020	Strategic Recruitment, Training, and Performance Management	3
HRM 6030	Employee Rights and Employer Obligations	3
HRM 6040	High-Performance Human Resources Systems and Development	3
HRM 6045	Change, Challenge, and Competence	3

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Information Security Management, Graduate Certificate

Information security is a management issue with global business implications. To succeed in today's network economy requires more than simply a focus on information technology (IT) issues. Succeeding also requires a focus on security strategy and management. IT security governance is an overarching consideration in all risk-assessment and management-related endeavors and is important for information security since many issues have legal, regulatory, policy, and ethical considerations. The associated risks of business today must be clearly understood and managed.

The Graduate Certificate in Information Security Management is designed to provide a conceptual and practical overview of information security management. It begins with an overview of key information security management issues and principles. It presents security governance challenges including the policy, law, regulatory, and ethical accountability frameworks that information security risk managers must work within. The program includes review courses that prepare students for the CISSP and CISA exams.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

ITC 6305	IT Infrastructure (Systems, Networks, Telecom)	3
ITC 6310	Information Security Governance	3
ITC 6315	Information Security Risk Management	3
ITC 6320	Information Security Technology	3

Information Security Management Electives

Complete two of the following:		6-8
ITC 6325	CISA Preparation	
ITC 6330	CISSP Preparation	
MIS 6082	Network Protection	
MIS 6080	Network Security Concepts	

Program Credit/GPA Requirements

18–20 total quarter hours required
Minimum 3.000 GPA required

Interactive Design, Graduate Certificate

Digital media plays an increasingly significant role in the global culture and economy. The Graduate Certificate in Interactive Design offers an overview of courses in the creative process of storytelling and communicating through visuals and sound. Students have an opportunity to gain expertise in time-based design and interface and experience design through a practice-oriented problem-solving approach.

The courses in this program also serve as a concentration in the Master of Professional Studies in Digital Media.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

DGM 6105	Visual Communications Foundation	4
DGM 6108	Programming Foundations for Digital Media	4
DGM 6168	Usability and Human Interaction	4
DGM 6217	Typography for Interactivity	4
DGM 6461	Interactive Information Design 1	4
DGM 6880	Portfolio	2

Program Credit/GPA Requirements

22 total quarter hours required
Minimum 3.000 GPA required

Interdisciplinary Professional Studies, Graduate Certificate

The contemporary workplace challenges professionals to develop and sustain the ever-changing skill sets and multidisciplinary workplace competencies required for success as innovators, leaders, and change agents. Organizations are similarly challenged in fostering employee professional development to meet the fluctuating demands of a highly technological and global economy. Today's professionals desire state-of-the-art approaches for continuing their education, including shorter, flexible, modularized, and just-in-time academic opportunities. To meet the growing demand for 21st-century learning, custom tailored to individual and organizational needs, Northeastern University's College of Professional Studies created the Interdisciplinary Graduate Certificate in Professional Studies—or iCert for short.

iCert represents a radically different approach to professional and academic learning. This first-of-its-kind certificate is uniquely designed to provide flexible multidisciplinary course options aligned with individual or organizational needs by incorporating three powerful learning components:

1. Intentional planning and reflection: Students identify and reflect on professional strengths, needs, aptitudes, and career interests in their iCert foundations course, resulting in a personalized professional learning plan (PLP).
2. Individualized program design: Students choose courses from multiple program areas, based on their PLP, customized to meet their academic goals.
3. Innovative experiential learning: Students choose from credit or noncredit real-world learning opportunities through Northeastern's online Experiential Network and their final iCert capstone course, connecting classroom learning to their current or future professional aspirations.

iCert graduates are encouraged to:

- Identify, reflect on, and articulate professional goals in order to envision a future self
- Develop a career focus that integrates and builds or enhances knowledge, skills, and attitudes around the following multidisciplinary workplace competencies:
  - Communications
  - Creative problem solving
  - Cultural responsiveness
  - Leadership
  - Lifelong learning
  - Management
  - Systems thinking
  - Technological proficiency
- Translate classroom learning into practice through authentic workplace experiences
- Build a professional practice as individuals, members of organizations, and socially responsible members of the global community
- Continue graduate studies in the following 10 master's degrees:
  - Corporate and organizational communication
  - Education
  - Homeland security
  - Human services
  - Leadership
  - Learning analytics
  - Nonprofit management
  - Project management
  - Sports leadership
  - Technical communication

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

EDU 6184	Interdisciplinary Foundations	2
EDU 6980	Interdisciplinary Capstone	2

Choose a minimum of 12 quarter hours from the following:

CORPORATE AND ORGANIZATIONAL COMMUNICATION

CMN 6080	Intercultural Communication	3
CMN 6020	Ethical Issues in Organizational Communication	3
CMN 6015	Introduction to the Digital Era: The Power of Social Media	3
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	3
CMN 6060	Negotiation, Mediation, and Facilitation	3
CMN 6025	Digital Era Skills: Platforms, Tools, and Techniques	3

EDUCATION

EDU 6319	How People Learn	4
EDU 6323	Technology as a Medium for Learning	4
EDU 6051	Culture, Equity, Power, and Influence	4
EDU 6333	Social Media and Beyond	4
EDU 6450	The Globalization of Education	4

LEARNING ANALYTICS

EDU 6340	Learning Analytics Concepts and Theories	4
EDU 6341	Introduction to Data Mining in Education	4
EDU 6343	Predictive Modeling for Learning Analytics	4
EDU 6182	Educational Statistics	4

HOMELAND SECURITY

HLS 6000	Introduction to Homeland Security	3

HUMAN SERVICES

HSV 6100	Theory and Practice of Human Services	3
HSV 6110	Human Services Management and Development	3
HSV 6120	Social Inequality, Social Change, and Community Building	3

LEADERSHIP

LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6

NONPROFIT MANAGEMENT

NPM 6110	Legal and Governance Issues in Nonprofit Organizations	3
NPM 6120	Financial Management for Nonprofit Organizations	3
NPM 6150	Human Resources Management in Nonprofit Organizations	3

PROJECT MANAGEMENT

PJM 5900	Foundations of Project Management	4
PJM 6000	Project Management Practices	3
PJM 6205	Leading and Managing Technical Projects	3
PJM 6210	Communication Skills for Project Managers	3
PJM 6215	Leading Remote Project Teams	3

SPORTS LEADERSHIP

LDR 6400	Sports Management	3

TECHNICAL COMMUNICATION

TCC 6100	Introduction to Technical and Professional Writing	4
TCC 6450	Managing Technical Publications	4
TCC 6430	Writing for the Computer Industry	4

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

International Biopharmaceutical Regulatory Affairs, Graduate Certificate

To work in today's global biopharmaceutical industry, there is a strong need to understand international regulations that impact the development, marketing, and manufacturing of pharmaceutical and biotechnology products.

The Graduate Certificate in Biopharmaceutical International Regulatory Affairs curriculum focuses on factors that facilitate the safety, performance, and efficacy of biomedical goods. Program training covers the assessment of international regulations and interpretation of their likely impact on a company's global commercialization strategies. Through participation in the program, students will have an opportunity to gain an understanding of international regulatory requirements necessary to implement such strategies.

Course work covers biotechnology and pharmaceutical product approval processes, regulatory analysis, and liability laws as they exist across different regulatory systems. The graduate certificate will provide core regulatory knowledge to students entering into the field from bench research, clinical studies, quality control/assurance, pharmacy, bioengineering, business, and legal analysis. The curriculum covers regulatory environments in Europe, Latin America, Australia, Japan, and other emerging economies. Courses from this certificate may be applied toward the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RGA 6220	Global Biotechnology Product Registration: E.U., U.S. Product Regulation	5
RGA 6227	Emerging Medical Device Markets	4
Complete two of the following:		8
RGA 6228	Managing International Clinical Trials	
RGA 6221	European Union Compliance Process and Regulatory Affairs	
RGA 6222	European Medical Device Regulations	

RGA 6223	Introduction to Canadian, Asian, and Latin American Regulatory Affairs
RGA 6224	Regulation of Biomedical Product Commercialization by Health Canada
RGA 6225	Japanese Medical Device Regulations and Registration
RGA 6226	Canadian and Australian Medical Device Regulations
RGA 6227	Emerging Medical Device Markets
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs
RGA 6212	Introduction to Safety Sciences

Program Credit/GPA Requirements

17 total quarter hours required
Minimum 3.000 GPA required

Leadership, Graduate Certificate

Today's cross-functional teams and organizations require a leadership style that capitalizes on the collective expertise and capabilities of the group. The development and mastery of collaborative leadership skills are not typically part of one's focused discipline preparation; hence, leadership requires deliberate development by those who assume leadership roles.

The Graduate Certificate in Leadership starts with the premise that everyone is capable of leadership. The program studies every aspect of leadership dynamics from the leader as an individual to working in teams and from the organization itself to the development of strategic leadership techniques. Course work exposes participants to a series of alternative perspectives of leadership, including collaborative models. Using the course's action-learning methods, participants build a personal model of leadership that they can put to immediate use in their workplace.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6140	Strategic Leadership	3-6

Leadership Electives

Complete two of the following:		6
LDR 6135	Ethical Leadership	
HRM 6005	Creating a High-Performance Organization: Strategic Organizational and HRM Choices	
LDR 6150	Transforming Organizations	
CMN 6010	Strategic Communication Management	

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Leading And Managing Technical Projects, Graduate Certificate

Whether you're an established project manager, or you're working in a technical field and aspire to be one, Northeastern's Graduate Certificate in Leading and Managing Technical Projects seeks to give you the foundational skills and practical knowledge you need to be successful.

Through courses you take online, our technical project management curriculum will give you the opportunity to:

- Develop the leadership and management skills to lead technical projects
- Learn how to communicate technical content to a nontechnical audience
- Gain practice leading remote teams, including global teams
- Plan and schedule projects using the most current and relevant methodologies
- Develop a personal leadership approach to motivate and inspire others

And should you choose, you can apply the credits you earn toward your certificate directly to our master's in project management (p. 311), master's in leadership (p. 308), master's in corporate and organizational communication (p. 299), or master's in Informatics (p. 296).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

PJM 6000	Project Management Practices	3
PJM 6205	Leading and Managing Technical Projects	3
PJM 6210	Communication Skills for Project Managers	3
PJM 6215	Leading Remote Project Teams	3
PJM 6220	Planning and Scheduling Technical Projects	3

Elective

Complete one of the following:		3
ITC 6035	Information Technology Project Management	
PJM 6140	Managing Troubled Projects	
PJM 6145	Global Project Management	

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Leading Communication Strategy and Talent Development, Graduate Certificate

The Graduate Certificate in Leading Communication and Talent Development responds to the growing demand for communicators who can assume a strategic advisory and leadership role. This certificate is intended to prepare communicators with the knowledge and competencies to:

- Participate in the development of their organization's strategic objectives through effective communication processes and activities
- Structure an effective communication function with a highly motivated team of communication professionals and appropriate allocation of resources
- Identify, mentor, and promote talented communication professionals
- Serve as a strategic advisor to the organization's senior management team

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

CMN 6200	Strategic Communications Advisor: Roles and Responsibilities	3
CMN 6201	Managing Communication Resources	3
CMN 6202	Management Symposium	3

Electives

Complete three of the following:		9
HRM 6020	Strategic Recruitment, Training, and Performance Management	
LDR 6120	Organizational Leadership	
PJM 6000	Project Management Practices	
PJM 6215	Leading Remote Project Teams	
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Learning Analytics, Graduate Certificate

Educators today are "swimming" in data about curricula, student assessment, social media, registrations, and demographics stored in data warehouses and "the cloud." This data makes it possible to collect, manage, and maintain massive amounts of educational information. The need to analyze and make data-based decisions in education has led to the emergence of a new field called learning analytics.

Through a set of focused courses, our curriculum will give you the opportunity to:

- Articulate and integrate diverse perspectives in the field of learning analytics, including learning analytics assumptions, theories, epistemologies, and debates
- Align learning analytics processes to address the needs of educational institutions and answer questions posed by educational leaders
- Select, prepare, implement, interpret, and evaluate learning analytic models appropriately

And should you choose, you can apply the credits you earn toward your certificate directly to our Master of Education concentration in learning analytics

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

EDU 6340	Learning Analytics Concepts and Theories	4
EDU 6341	Introduction to Data Mining in Education	4
EDU 6182	Educational Statistics	4
EDU 6343	Predictive Modeling for Learning Analytics	4

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Medical Devices Regulatory Affairs, Graduate Certificate

The national and regional medical device industries have continued to experience significant market growth, despite the fluctuations in the overall global economy. There are more than 7,000 medical device companies in the United States alone, and nearly 1,000 of these are based in Massachusetts. In total, the medical device sector in Massachusetts employs 36,000 workers, has a payroll of over $1.8 billion, and annual product shipments of $7.3 billion.

The Graduate Certificate in Medical Devices Regulatory Affairs provides students with an opportunity to gain a detailed knowledge of the regulations influencing the commercialization of new and existing medical devices. The intensely practical curriculum spans the entire life cycle of product development and introduces students to the salient features governing both pre- and postapproval stages. The program content also examines the relationship between regulatory agencies and the medical device industry. Students have the opportunity to take specialized courses on regulatory systems outside the United States.

The certificate will help advance the careers of students coming from such fields as bioengineering, quality control/assurance, intellectual property, business, and marketing. The choice of several courses makes this certificate ideal for students already working in the regulatory world as well as those just entering into the profession.

Courses from this certificate may be applied toward the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6205	Emerging Trends and Issues in the Medical Device Industry	4
RGA 6000	Introduction to Food and Drug Administration (FDA) Pharmaceutical Regulation	2
RGA 6001	Introduction to Food and Drug Administration Medical Device Regulation	2

Medical Devices Regulatory Affairs Electives

Complete one of the following:		4-5
BTC 6260	The Business of Medicine and Biotechnology	
RGA 6211	Combination Products and Convergence	
RGA 6112	Biomedical Intellectual Property Management: Patents	
RGA 6222	European Medical Device Regulations	
RGA 6225	Japanese Medical Device Regulations and Registration	
RGA 6226	Canadian and Australian Medical Device Regulations	
RGA 6227	Emerging Medical Device Markets	
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	
RGA 6370	Regulatory Writing: Medical Device Submissions	

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Nonprofit Management, Graduate Certificate

Nonprofits today simply require a higher level of management expertise. Nonprofit managers are required to manage people and programs more efficiently and effectively. The Graduate Certificate in Nonprofit Management focuses on developing skills in organizational management, financial management, fund-raising, grant and report writing, human resources management, and governance.

The program integrates theoretical approaches with practical application to prepare students for positions in either small or large nonprofit organizations. The program targets individuals who work in the nonprofit sector as executive directors, managers, program staff, board members, and volunteers. Students have an opportunity to participate in case studies, individual and group projects, and class discussions.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

NPM 6110	Legal and Governance Issues in Nonprofit Organizations	3
NPM 6120	Financial Management for Nonprofit Organizations	3
NPM 6125	Promoting Nonprofit Organizations	3
NPM 6130	Fund-Raising and Development for Nonprofit Organizations	3
NPM 6140	Grant and Report Writing	3
NPM 6150	Human Resources Management in Nonprofit Organizations	3

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Organizational Communication, Graduate Certificate

The study of organizational communication focuses on the dynamics of communication in complex organizations for the purpose of learning how individuals within such organizations can become effective communicators. Whether the context of such communication is meetings or professional presentations, communicating during a crisis, or intercultural exchanges, the message is consistent: Effective communication is a crucial factor in determining organizational success.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

CMN 6010	Strategic Communication Management	3
CMN 6020	Ethical Issues in Organizational Communication	3
CMN 6910	Organizational Communication Assessment	3
Complete two of the following:		6
CMN 6061	Personal Branding	
CMN 6050	Crisis Communication	
CMN 6060	Negotiation, Mediation, and Facilitation	
Complete one of the following:		3
CMN 6080	Intercultural Communication	
CMN 6090	Organizational Culture, Climate, and Communication	
CMN 6100	Communication Networks and Managing Information	
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	
CMN 6015	Introduction to the Digital Era: The Power of Social Media	

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Port Security, Graduate Certificate

The Graduate Certificate in Port Security examines U.S. and international policy, laws, and regulations for maritime and aviation security in light of current security challenges, terrorism and transnational criminal threats, and the potential U.S. and global impact of maritime and aviation security failures. Emergency response and recovery mechanisms and implementation as well as organizations and associations critical to modern U.S. maritime and aviation port security infrastructure protection will be evaluated and exercised.

The certificate offers leaders an opportunity to evaluate maritime and aviation security risks, threats, and measures to mitigate within applicable U.S. and international policy, assess and implement response and planning mechanisms for maritime transportation system security and aviation and airport security requirements, and conduct real-world actionable planning and strategy development for maritime and aviation security response and crisis management, among other essential skills for senior leaders.

This certificate is ideal for homeland security professionals and industry leaders responsible for maritime and aviation port security, incident management and response, and the planning and execution of maritime and aviation operations within today's security challenges.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

HLS 6100	Maritime and Port Security 1	4
HLS 6110	Maritime and Port Security 2	4
HLS 6120	Aviation Security 1	4
HLS 6130	Aviation Security 2	4
HLS 6140	Port Security Capstone	4

Program Credit/GPA Requirements

20 total quarter hours required
Minimum 3.000 GPA required

Professional Sports Administration, Graduate Certificate

The revenue of the global professional sports industry has grown to $145 billion and also projects an increase in jobs by up to 13 percent by 2020 (PwC, 2015).

The Graduate Certificate in Professional Sports Administration is designed to give students an in-depth understanding of this professional segment of the sports industry. Through the program's curriculum, students will be given the opportunity to acquire professional leadership skills and knowledge in a variety of topical areas including sports management, marketing, sponsorship, event management, risk management, and finance.

Upon completion, all credits earned in the professional sports administration certificate can also be applied directly into the Master of Sports Leadership (p. 321) program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

LDR 6323	Event Management	3
LDR 6400	Sports Management	3
LDR 6435	Fiscal Practices in Sports	3
LDR 6440	Sports Marketing and Promotions	3
LDR 6445	Corporate Sponsorships	3
LDR 6460	Risk Management in Athletics	3

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Program and Portfolio Management, Graduate Certificate

The increasingly important role of program and portfolio managers is clear, as we see more companies orienting their work in a projectized fashion. Not only are companies seeking to projectize their workflow, but they are seeking to better align projects with the strategic direction of the company and industry. Program and portfolio managers need to be able to evidence the strategic value that projects are accomplishing and can continue to accomplish in their organizational context.

The need for organizations to coordinate their related projects into programs and to seek to understand the value of their work through the lens of a portfolio is recognized throughout all industry sectors. This has been made clear through the creation of advanced industry certifications, such as the Program Management Professional (PgMP®) and the Portfolio Management Professional (PfMP®) credential by the Project Management Institute.

Northeastern University's Graduate Certificate in Program and Portfolio Management is designed to prepare individuals with the knowledge, skills, and tools needed to effectively manage project-based programs and portfolios.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

PJM 6710	Introduction to Program and Portfolio Management	3
PJM 6715	Advanced Program Management	3
PJM 6720	Advanced Portfolio Management	3
PJM 6725	Program and Portfolio Leadership	3
PJM 6730	Program and Portfolio Evaluation	3
PJM 6735	Program and Portfolio Management Capstone	3

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Project Management, Graduate Certificate

Technical and managerial employees at all levels of organizations are being asked to manage small and large projects. Many of these professionals have not been specifically trained to effectively and efficiently manage projects. The task of managing projects has its own body of knowledge. This program seeks to provide the practical and theoretical knowledge for which the Project Management Institute tests, and it is expected that individuals who successfully complete this program will be capable of fulfilling the education requirements of the Project Management Professional (PMP) certification exam.

This certificate program in project management is designed with sufficient course flexibility to accommodate professionals with various levels of project management experience. Project management principles are applicable to both manufacturing and service industries, including professionals in fields such as software engineering, construction management, and financial services.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

Note: Foundations of Project Management (PJM 5900) is required for students who do not have at least two years of professional experience working on projects. This course is intended only for those who are not

familiar with professional project work. Students with two years or more of professional project experience should not take this course:

PJM 5900	Foundations of Project Management	4
PJM 6000	Project Management Practices	3
PJM 6025	Project Scheduling and Cost Planning	3
PJM 6015	Project Risk Management	3

Project Management Electives

Complete three of the following. Note: Students who take PJM 5900 are required to take only two courses in this section:		9
PJM 6125	Project Evaluation and Assessment	
PJM 6135	Project Quality Management	
PJM 6140	Managing Troubled Projects	
PJM 6705	Portfolio Management in the Enterprise Environment	

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Public and Media Relations, Graduate Certificate

There is growing demand for communication professionals with digital media skills and a strategic perspective on brand and reputation management. According to the Bureau of Labor Statistics, employment of public relations specialists and managers will grow by 12 percent and 13 percent, respectively. The Graduate Certificate in Public and Media Relations is designed to prepare communication professionals who focus on external stakeholders for the challenges of a rapidly changing industry. This program focuses on developing strategic communication plans, crafting compelling messages, and performing audience research, while preparing students with the latest skills in digital platforms, tools, and techniques.

The goal of this program is to equip graduates with the knowledge and skills to:

- Design and produce public and media relations campaigns using written materials, social media, audio, video, and web-based tools
- Identify and anticipate audience behavior and expectations using primary and secondary research methods
- Strategically design, implement, and evaluate campaigns that support organizational performance

The courses in this program also serve as a concentration in the Master of Science in Corporate and Organizational Communication (p. 299).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

PBR 6100	Introduction to Public Relations	3
PBR 6710	Public Relations Research: Understanding External Audiences	3
PBR 6130	Public Relations Writing Seminar 1	3
PBR 6140	Public Relations Writing Seminar 2	3

Elective Courses

Complete two of the following:		6-7
CMN 6025	Digital Era Skills: Platforms, Tools, and Techniques	
CMN 6035	Legal, Policy, and Ethical Issues in the Digital Era	
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	
DGM 6290	Social Media and Brand Strategy Implementation	
PBR 6120	Public Relations Legal Issues	
PBR 6125	Community Relations and Corporate Social Responsibility	

Program Credit/GPA Requirements

18–19 total quarter hours required
Minimum 3.000 GPA required

Remote Sensing, Graduate Certificate

Remote sensing is the measurement of information by a recording device that is not in physical contact with the object being measured. In practice, remote sensing is the utilization at a distance (as from aircraft, space shuttle, spacecraft, satellite, or ship) of any device for gathering information about the environment. The term remote sensing is most often applied to terrestrial and weather observations but can be applied to planetary environments and astronomy. Remote sensing is applicable to many other situations, including land-use change, pollution tracking, land-use and planning, transportation systems, and military observation.

The online Graduate Certificate in Remote Sensing aims to make education and training in remote sensing available to adult and professional students. The remote sensing certificate program seeks to produce students who are well versed in remote sensing theory, who have hands-on exposure to remote sensing software and hardware, and who have learned how to extract pertinent data from remotely sensed data sets. This six-course certificate program seeks to provide students with the necessary skills and understanding to apply remote sensing knowledge competently and effectively in a variety of areas.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Courses

RMS 5105	Fundamentals of Remote Sensing	3
RMS 6110	Digital Image Processing	3

Remote Sensing Electives

Complete four of the following:		12
RMS 6210	Technology, Operations, and Requirements for Drones, Helicopters, and Airplanes	
RMS 6230	Remote Sensing and Global Change	
RMS 6240	Introduction to Radar and LIDAR Remote Sensing	
RMS 6250	Remote Sensing of Vegetation	
RMS 6270	Remote Sensing for Disaster Management	

RMS 6280	Automated Feature Extraction for the Geospatial Professional
RMS 6290	Spectroscopic Image Analysis
RMS 6292	Photogrammetry and GPS
GIS 6394	Crisis Mapping for Humanitarian Action

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

Respiratory Specialty Practice, Graduate Certificate

The goal and planned outcome of the respiratory specialty practice certificate program is to meet the need for registered respiratory therapists (RRTs) to document their competency in one of four respiratory care specialist practice areas:

1. Adult critical care
2. Neonatal and pediatric intensive care
3. Asthma and COPD education/wellness coordination
4. Pulmonary function testing

The goal and expected outcome is to help students working in these areas to reach a competency level where they can become board-certified specialists in one or more of the four specialty areas.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

RPT 7400	Pulmonary Diseases and Disorders	4
RPT 7401	Cardiopulmonary Assessment and Diagnostics	4

Electives

Select two of the following courses:

RPT 7402	Adult Critical Care	4
RPT 7403	Neonatal and Pediatric Care	4
RPT 7404	Pulmonary Wellness Education and Coordination	4
RPT 7405	Development of Patient Management Plans	4

Program Credit/GPA Requirements

16 total quarter hours required
Minimum 3.000 GPA required

Social Media and Online Communities, Graduate Certificate

Social media management and strategy development have become core skills required for communication professionals. According to WANTED Analytics, 1.6 million working professionals utilize social media skills in jobs at the manager and executive level. The Graduate Certificate in Social Media and Online Communities focuses on strategic framework and the role digital media has in supporting organizational performance. The program integrates theory and practice, including experimenting with various tools and platforms and reflecting on lessons learned from active management and experimentation.

Students completing the program will have the opportunity to obtain the knowledge and skills to:

- Take a strategic approach to the design and implementation of social media channels and online communities
- Learn how to define metrics for measuring success, develop training, and evaluate the performance of social media activities
- Manage organizational risks and learn best practices in the creation of social media policies and guidelines

Courses within the social media and online communities certificate program also serve as a concentration through the Master's in Corporate and Organizational Communication program (p. 299).

Program Requirements

Required Courses

Complete six of the following (CMN 6025, CMN 6035, CMN 6045, and CMN 6065 are required):		19-21
CMN 6015	Introduction to the Digital Era: The Power of Social Media (Students may waive CMN 6015 if they have social media experience. Please consult with your academic advisor.)	
CMN 6025	Digital Era Skills: Platforms, Tools, and Techniques	
CMN 6035	Legal, Policy, and Ethical Issues in the Digital Era	
CMN 6045	Leveraging Digital Technologies: Strategy, Assessment, and Governance	
CMN 6065	Implementation and Management of Social Media Channels and Online Communities	
Select one or two (if CMN 6015 has been waived) of the following:		
DGM 6285	Interactive Marketing Fundamentals	
DGM 6290	Social Media and Brand Strategy Implementation	
TCC 6710	Content Strategy	
CMN 6040	Consumer Behaviors in the Online Environment	

Program Credit/GPA Requirements

19–21 total quarter hours required
Minimum 3.000 GPA required

Teaching English To Speakers Of Other Languages, Graduate Certificate

The Graduate Certificate in Teaching English to Speakers of Other Languages (TESOL) is designed to provide students with a solid foundation in the structure and use of English language. The certificate offers teaching strategies, firmly grounded in research, theory, and practice, to instruct ESL/EFL (English as a Second Language/ English as a Foreign Language) to adults in the United States or internationally. Students have an opportunity to develop learning e-portfolios as part of their course work.

Topics covered by the program include best practices in TESOL methodology through a combination of lecture, small group work, reflection, classroom observation, and a practicum that provides hands-on experience designing lessons, materials, and assessments. Whether

students want to teach English abroad, work with immigrant adult populations in the United States, or teach English at the university level, this graduate certificate will provide them with an opportunity to gain a combination of theoretical and practical training to teach English to speakers of other languages in international contexts, community colleges, and within organizations devoted to adult English-language learners.

This certificate does not lead to Massachusetts licensure.

SPECIAL REQUIREMENTS:

- The TESOL certificate program may be completed in two quarters and is offered 100 percent online.
- Students have the option to complete the practicum component online or on-ground.
- The program has two start terms: fall quarter and spring quarter.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

EDU 6300	Introduction to Language and Linguistics	4
EDU 6534	Bilingualism, Second Language, and Literacy Development	4
EDU 6558	Issues in Education	1-4
EDU 6302	Teaching, Learning, and Assessment: How English Is Learned and Used	4
EDU 6312	TESOL Practicum and Seminar	5

Program Credit/GPA Requirements

18 total quarter hours required
Minimum 3.000 GPA required

College of Science

Website (http://www.northeastern.edu/cos/graduate)

Kenneth W. Henderson, PhD, Dean
TBD, Associate Dean, Undergraduate Affairs
David E. Budil, PhD, Associate Dean, Research and Graduate Affairs
Frederick C. Davis, PhD, Associate Dean, Faculty Affairs, Diversity and Inclusion
Jonathan Dudley, MBA, Associate Dean, Administration and Finance
James Poulos, MA, Associate Dean, Development
Lauren Machunis, MS, Assistant Dean for Undergraduate Advising and Enrollment Management

115 Richards Hall
617.373.5085
617.373.8583 (fax)
cos@northeastern.edu

The College of Science seeks to offer advanced students outstanding academics and real-world research experience through cutting-edge research opportunities that are both discipline based and interdisciplinary. Our doctoral and master's degree programs in the physical sciences, life sciences, and mathematics seek to give students a deep understanding of emerging fields such as chemical biology, cognition and neuroscience, environmental and marine science, biochemistry, bioinformatics, biotechnology, nanoscience, and network science. Our programs are positioned at the forefront of discovery, invention, and innovation. We seek to prepare students and professionals to enter the scientific workforce serving the academy, government, or private sector.

Academic Policies and Procedures

Grading Policies

In the College of Science, not more than two courses or 6 semester hours of credit, whichever is greater, may be repeated to satisfy the requirements for the degree. Only such repeats will be counted in calculating the cumulative grade-point average.

No grade changes are permitted after the end of the final examination period one calendar year from the semester in which the student registered for the course. In calculating the overall cumulative average, all graduate-level course work completed at the time of clearance for graduation will be counted unless the student is immediately continuing on for a PhD degree in his or her department.

Course Registration

Students are encouraged to obtain advisor approval of course selections each semester. This approval is required for all assistantship recipients, and some departments require it for all students. Students should check with individual departments for specific guidelines.

Transfer Credit

A student may petition to transfer up to 9 semester hours of his or her program using credits from another institution, provided that the credits transferred consist of a grade of B (3.000) or better in graduate-level courses, have been earned at a U.S–accredited institution, and have not been used toward any other degree. *Note:* If approved by the College of Science, credits from Northeastern University's College of Professional Studies (CPS) transfer to the College of Science as external credits and count toward the 9-semester-hour maximum of transfer credit. As courses at other institutions may not parallel courses at Northeastern, the student's academic department will determine the number of semester hours the external course will be worth. This calculation may result in fewer semester hours than the course was assigned at the institution at which the student completed the course. In addition, courses accepted for transfer credit must have been completed within five years of the date the student is admitted to graduate study. Grades are not transferred. Some departments may accept fewer than 9 transfer credits.

Awards

Only those students who are registered in degree programs are eligible for awards. Award recipients will receive an official award letter from the College of Science via email. Pay attention to this letter as it is an official contract that should be read carefully. In addition, to maintain awards, students must be making satisfactory progress toward their degrees.

Receipt of financial support administered by the College of Science is contingent on satisfactory academic progress toward the degree and on meeting department-specific guidelines. The College of Science requires that all students receiving awards will generally have two semesters to reach a 3.000 grade-point average (GPA). Students whose cumulative GPA is below 3.000 will be reviewed by their departments and by the College of Science and may have their funding terminated on recommendation of their department or by decision of the College of Science in consultation with their department. Renewals of awards will depend on the student making satisfactory academic progress toward the degree, including a GPA of 3.000 or the department's minimum GPA, if it is higher than the College of Science minimum, and satisfactory performance of any duties required by the award.

Satisfactory Progress

Satisfactory progress means satisfying requirements in the College of Science, in this graduate catalog, and in the regulations specified by the departments.

The College of Science sets minimum standards for all students to fulfill. Departments and programs may have additional requirements that exceed those of the College of Science. Students in the College of Science must be making satisfactory progress, including working toward the graduation requirement of a grade-point average of 3.000 in their course work and the timely completion of course work and comprehensive/qualifying examinations. See also the university's policy on academic standing ("Minimum Cumulative Grade-Point Average (p. 27)").

Time Limitation

Refer to university policy regarding time limitations. If students wish to apply for an extension of the time limit, they must submit a petition to their department of study. The petition must include a detailed plan for completion of all remaining degree requirements. In the case of master's degree time limit extension requests for course work, the department must certify that the content of each of the courses has not changed since the time the student completed the course. If deemed appropriate, the department will recommend a time limit extension to graduate student services. The associate dean for academic affairs has final approval of time limit extensions.

Changes in Requirements

The continuing development of the College of Science graduate programs requires regular revision of curricula. When no hardship is imposed on the student because of changes and the facilities of the school permit, the student is expected to meet the most recent requirements. However, if it can be demonstrated to the director of graduate admissions and student services that doing so does impose a substantial hardship, the requirements of the year in which the student matriculated will be applicable.

The Doctor of Philosophy Degree (PhD)

The Doctor of Philosophy degree is awarded to candidates who provide evidence of high scholastic attainment and research ability in their major field. Specific degree requirements are administered by a committee in charge of the degree program. It is the responsibility of the chair of this committee to certify to the College of Science the completion of each requirement for each candidate.

Residence Requirement

A Doctor of Philosophy degree student must spend the equivalent of at least one academic year in residence at the university as a full-time graduate student. The committee of each degree program specifies the method by which the residence requirement is satisfied.

Qualifying Exam

In programs where a qualifying exam is required, students must complete this requirement within the time limit set by the program of study.

Comprehensive Examination

Degree programs may require a comprehensive examination. Generally, students are expected to complete all of the required degree course work prior to taking the comprehensive examination. Students must complete this requirement within the time limit set by the program of study, usually within one term of completing the required course work.

Doctoral Degree Candidacy

PhD degree candidacy is established when students have completed all departmental and university requirements for candidacy. These requirements vary by department and include completing the minimum number of graduate semester hours required of doctoral students by the department (this may include an earned master's degree accepted by the department) and passing a qualifying examination and/or a comprehensive examination. Once students reach doctoral degree candidacy they will be certified, in writing, by the college. Registration in course work is not permitted once a student reaches candidacy.

Continuity of Registration

For each of the first two semesters that a doctoral candidate has established candidacy, the student must register for Dissertation. For each semester beyond the two Dissertation registrations, the student must register for Doctoral Dissertation Continuation until the dissertation is approved by the College of Science. During the terms when a student is registered for Doctoral Dissertation or Dissertation Continuation, course work is not permitted as the course requirements for the degree have already been met. If the academic program requires enrollment in seminars or courses in addition to Dissertation or Dissertation Continuation, the department's graduate coordinator will make a recommendation to the College of Science for approval. Approval must happen prior to registration. Students must be registered for Dissertation or Dissertation Continuation during the semester in which they take the final oral examination (including the full summer semester if that is when defense occurs). Any student who does not attend Northeastern University for a period of one year may be required to apply for readmission.

Dissertation

Each doctoral student must complete a dissertation that embodies the results of extended research and makes an original contribution to the field. This work should give evidence of the candidate's ability to carry out investigation and interpret in a logical manner the results of the research. The method of approval of the dissertation is established by the committee in charge of the degree program. The chair of the dissertation committee must be a full-time member of the faculty of Northeastern University. In addition, the chair of the dissertation committee must hold a doctoral degree. Typically, only one external committee member is allowed.

Final Oral Examination

The final oral examination will be on the subject matter of the doctoral dissertation and on important developments in the field of the dissertation. Other fields may be included if recommended by the examining committee. This examination will be taken after completion of all other degree requirements and must be held at least two weeks prior to the Commencement at which the PhD is awarded. The oral exam must take place on campus in the presence of the chair/advisor and other dissertation committee members. The dissertation defense must be publicly announced prior to the defense and the opportunity given for other students, staff, and faculty to attend.

Interdisciplinary Doctoral Programs

Some graduate students may wish to pursue doctoral programs that involve substantial work in two or more departments. To meet this need, an interdisciplinary program may be established that corresponds in scope and depth to doctoral standards but does not agree exactly with the individual departmental regulations. Consult this graduate catalog for policies and guidelines pertaining to this doctoral option.

The Master's Degree Academic Requirements

A candidate for the master's degree must complete a minimum of 30 semester hours of graduate-level course work and such other study as may be required by the department in which the student is registered.

To qualify for the degree, a minimum cumulative average of 3.000, equivalent to a grade of B, must be obtained. This average will be calculated each semester according to the university grading system and will exclude any transfer credits or repeated courses. A student who does not make satisfactory progress toward degree requirements, as specified by the individual department, may be terminated from the program.

Comprehensive Examination

A final written or oral comprehensive examination is required in some programs. This examination will be given by the department concerned at least two weeks before the Commencement at which the degree is expected to be conferred.

Thesis

A master's thesis is required in some programs and should demonstrate the individual's capacity to execute independent work based on original material. Registration for Thesis is required in most programs.

Theses must be approved by the departmental graduate committee and, in cases in which a grade is required, must receive a grade of B (3.000) or better to be accepted.

Continuity of Registration

Students are expected to maintain satisfactory progress toward their intended degrees. All students must be registered in the last semester of their program.

Biology

Website (http://www.northeastern.edu/biology)

Jonathan L.Tilly, PhD
University Distinguished Professor and Chair

134 Mugar Life Sciences Building
617.373.2260
617.373.3724 (fax)
gradbio@northeastern.edu

Director of Graduate Studies for Biology
Erin J. Cram, PhD, Associate Professor, e.cram@northeastern.edu

Director of Graduate Studies for Bioinformatics
Steven Vollmer, PhD, Associate Professor, s.vollmer@northeastern.edu

The biology PhD and MS programs seek to provide a broad background knowledge base in conjunction with in-depth study of a specialized area of biology. The programs emphasize close interaction between graduate students and faculty members in developing the intellectual and experimental skills required for creative, independent research. The Master of Science in Bioinformatics seeks to prepare students to enter the research management and technology transfer fields.

The PhD program entails course work from a core biology curriculum along with advanced courses in the student's area of research interest. This is complemented by intensive research and completion of a dissertation under faculty supervision. Faculty research includes biochemistry, microbiology, cell and molecular biology, genetics, neurobiology, regenerative biology, and the biology of reproduction.

The Master of Science in Bioinformatics is a professional program that consists of four parts: fundamental courses, core courses, an internship, and electives. All courses are available in the late afternoon or evening to accommodate those who are employed during the day.

Programs

Doctor of Philosophy (PhD)

- Biology (p. 342)
- Biology—Advanced Entry (p. 343)

Master of Science (MS)

- Bioinformatics (p. 343)
- Bioinformatics—ALIGN Program (p. 344)

Biology, PhD

The biology PhD program seeks to provide a broad background knowledge base in conjunction with in-depth study of a specialized area of biology. Two optional concentrations are available: cell and molecular biology and molecular microbiology. The program emphasizes close interaction between graduate students and faculty members in developing the intellectual and experimental skills required for creative, independent research.

The PhD program entails course work from a core biology curriculum along with advanced courses in the student's area of research interest. This is complemented by intensive research and completion of a dissertation under faculty supervision. Faculty research includes biochemistry, microbiology, cell and molecular biology, genetics, neurobiology, regenerative biology, and the biology of reproduction.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Dissertation committee
Dissertation proposal
Colloquia (minimum of three)
First-author publication
Dissertation defense

General Requirements

Research Ethics		
BIOL 7399	Research Problem Solving, Ethics, and Communication Skills	4
Colloquium		
Complete the following (repeatable) course twice:		2
BIOL 5100	Biology Colloquium	
Dissertation Courses		
Complete the following (repeatable) course twice:		
BIOL 9990	Dissertation	

BIOLOGY PHD WITHOUT CONCENTRATION

Required Course Work

Complete 8 semester hours from the following:		8
BIOL 6303	Neurobiology and Behavior	
BIOL 6399	Dynamics of Microbial Ecology	
BIOL 6401	Research Methods and Critical Analysis in Molecular Cell Biology	
BIOL 6405	Prokaryotic Cell and Molecular Biology	
BIOL 6407	Biochemistry for Molecular Biologists	
EEMB 6402	Concepts and Trends in Evolution and Ecology	
Electives		
Complete 16 semester hours from the following:		16
BIOL 5103 to BIOL 8674		

Concentrations

- Cell and Molecular Biology (p.)
- Molecular Microbiology (p. 343)

CELL AND MOLECULAR BIOLOGY CONCENTRATION

Required Course Work

BIOL 6401	Research Methods and Critical Analysis in Molecular Cell Biology	4
BIOL 6407	Biochemistry for Molecular Biologists	4
Electives		
In consultation with faculty advisor, complete 16 semester hours from the topic of cell and molecular biology:		16
BIOL 5103 to BIOL 8674		

MOLECULAR MICROBIOLOGY CONCENTRATION

Required Course Work

Complete 8 semester hours from the following:		8
BIOL 6399	Dynamics of Microbial Ecology	
BIOL 6405	Prokaryotic Cell and Molecular Biology	
BIOL 6407	Biochemistry for Molecular Biologists	
Electives		
In consultation with faculty advisor, complete 16 semester hours from the topic of molecular microbiology:		16
BIOL 5103 to BIOL 8674		

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Biology, PhD—Advanced Entry

The biology PhD program seeks to provide a broad background knowledge base in conjunction with in-depth study of a specialized area of biology. The program emphasizes close interaction between graduate students and faculty members in developing the intellectual and experimental skills required for creative, independent research.

Students entering the PhD program with a related Master of Science degree typically have significantly reduced course loads. An individualized course of study is designed by the biology graduate curriculum committee in consultation with the student and the student's advisor. The student can then focus on intensive research and completion of a dissertation under faculty supervision. Faculty research includes biochemistry, microbiology, cell and molecular biology, genetics, neurobiology, regenerative biology, and the biology of reproduction. Financial support (teaching assistantships or research assistantships) is normally provided for PhD students who are making satisfactory progress toward completion of their degree.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Dissertation committee
Dissertation proposal
Colloquia (minimum of three)
First-author publication
Dissertation defense

General Requirements

APPROVED COURSE WORK

Consult your faculty advisor for acceptable courses.

APPROVED ELECTIVES

Consult your faculty advisor for acceptable electives.

Dissertation Courses

Dissertation		
Complete the following (repeatable) course twice:		
BIOL 9990	Dissertation	

Program Credit/GPA Requirements

Variable total semester hours required
Minimum 3.000 GPA required

Bioinformatics, MS

The Master of Science (MS) in Bioinformatics seeks to provide students with core knowledge in bioinformatics programming, integrating knowledge from the biological, computational, and mathematical disciplines. Students in the MS program gain professional work experience via co-op. The program offers students an opportunity to become equipped to apply bioinformatics and computational methods to biological problems.

The program entails a required core of course work in computational methods, programming, and statistics, enhanced by electives in molecular biology, biochemistry, molecular modeling, web development, database design and management, data mining, and other related topics.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Computational Methods		
BINF 6308	Bioinformatics Computational Methods 1	4
BINF 6309	Bioinformatics Computational Methods 2	4
Research and Seminar		
BIOL 6381	Ethics in Biological Research	2
BINF 7385	Bioinformatics Seminar	2
Statistics and Programming		

BINF 6200	Bioinformatics Programming	4
MATH 7340	Statistics for Bioinformatics	4
Co-op		
BINF 6964	Co-op Work Experience	0

Electives

Complete 12 semester hours from the following. Electives outside this list may be chosen in consultation with faculty advisor.		12
BIOL 5543	Stem Cells and Regeneration	
BIOL 5549	Microbial Biotechnology	
BIOL 5569	Advanced Microbiology	
BIOL 5571	Microbial Ecology	
BIOL 5573	Medical Microbiology	
BIOL 5581	Biological Imaging	
BIOL 5583	Immunology	
BIOL 5585	Evolution	
BIOL 5587	Comparative Neurobiology	
BIOL 5591	Advanced Genomics	
BIOL 5593	Cell and Molecular Biology of Aging	
BIOL 6299	Molecular Cell Biology for Biotechnology	
BIOL 6300	Biochemistry	
BIOL 6301	Molecular Cell Biology	
BIOL 6303	Neurobiology and Behavior	
BIOL 6399	Dynamics of Microbial Ecology	
BIOL 6407	Biochemistry for Molecular Biologists	
BIOT 5219	The Biotechnology Enterprise	
CHEM 5638	Molecular Modeling	
CS 5010	Programming Design Paradigm	
CS 5100	Foundations of Artificial Intelligence	
CS 5200	Database Management Systems	
CS 5400	Principles of Programming Language	
CS 5500	Managing Software Development	
CS 5600	Computer Systems	
CS 5610	Web Development	
CS 5700	Fundamentals of Computer Networking	
CS 5800	Algorithms	
CS 6140	Machine Learning	
CS 6200	Information Retrieval	
CS 6220	Data Mining Techniques	
DA 5020	Collecting, Storing, and Retrieving Data	
DA 5030	Introduction to Data Mining/Machine Learning	
EEMB 5130	Ecological Dynamics	
MATH 5104	Basics and Probability and Statistics	
MATH 5121	Topology 1	
MATH 5122	Geometry 1	
MATH 5131	Introduction to Mathematical Methods and Modeling	
PHYS 5116	Complex Networks and Applications	
PHYS 7331	Network Science Data	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Bioinformatics, MS—ALIGN Program

The Master of Science in Bioinformatics through the ALIGN program combines core course work in bioinformatics computerized methods, programming, and statistics with graduate electives that offer you the flexibility to specialize and build broader knowledge in both the life sciences and computer sciences. A co-op, frequently completed with leading employers in academia and industry, rounds out the program and assures graduates a competitive edge in the dynamic field of bioinformatics.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

ALIGN Course Work		
BIOL 6301	Molecular Cell Biology	4
Computational Methods		
BINF 6308	Bioinformatics Computational Methods 1	4
BINF 6309	Bioinformatics Computational Methods 2	4
Research and Seminar		
BIOL 6381	Ethics in Biological Research	2
BINF 7385	Bioinformatics Seminar	2
Statistics and Programming		
BINF 6200	Bioinformatics Programming	4
MATH 7340	Statistics for Bioinformatics	4
Co-op		
BINF 6964	Co-op Work Experience	0

Electives

Complete 12 semester hours of graduate electives. You may choose electives outside this list in consultation with your faculty advisor.		12
BIOL 5543	Stem Cells and Regeneration	
BIOL 5549	Microbial Biotechnology	
BIOL 5569	Advanced Microbiology	
BIOL 5571	Microbial Ecology	
BIOL 5573	Medical Microbiology	
BIOL 5581	Biological Imaging	
BIOL 5583	Immunology	
BIOL 5585	Evolution	
BIOL 5587	Comparative Neurobiology	
BIOL 5591	Advanced Genomics	
BIOL 5593	Cell and Molecular Biology of Aging	
BIOL 6299	Molecular Cell Biology for Biotechnology	
BIOL 6300	Biochemistry	

BIOL 6301	Molecular Cell Biology (may count towards core and elective requirement)
BIOL 6303	Neurobiology and Behavior
BIOL 6399	Dynamics of Microbial Ecology
BIOL 6407	Biochemistry for Molecular Biologists
BIOT 5219	The Biotechnology Enterprise
CHEM 5638	Molecular Modeling
CS 5010	Programming Design Paradigm
CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5400	Principles of Programming Language
CS 5500	Managing Software Development
CS 5600	Computer Systems
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking
CS 5800	Algorithms
CS 6140	Machine Learning
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
DA 5020	Collecting, Storing, and Retrieving Data
DA 5030	Introduction to Data Mining/Machine Learning
EEMB 5130	Ecological Dynamics
MATH 5104	Basics and Probability and Statistics
MATH 5121	Topology 1
MATH 5122	Geometry 1
MATH 5131	Introduction to Mathematical Methods and Modeling
PHYS 5116	Complex Networks and Applications
PHYS 7331	Network Science Data
PPUA 5301	Introduction to Computational Statistics
PPUA 5302	Information Design and Visual Analytics

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Chemistry and Chemical Biology

Website (http://www.northeastern.edu/chemistry)

Michael P. Pollastri, PhD
Associate Professor and Chair

102 Hurtig Hall
617.373.2822

Carla Mattos, PhD
Professor and Director of Graduate Studies for Chemistry and Chemical Biology, c.mattos@northeastern.edu

Cara Shockley
Graduate Administrative Officer for Chemistry and Chemical Biology
c.shockley@northeastern.edu, 617.373.2824

Jared Auclair, PhD
Director of Graduate Studies for Biotechnology,
j.auclair@northeastern.edu

Cynthia Bainton, Administrative Operations Manager for Biotechnology,
c.bainton@northeastern.edu, 617.373.2627

The department offers thesis- and non-thesis-based advanced degrees with concentrations in analytical, inorganic, organic, and physical chemistry and in interdisciplinary fields such as polymers, materials, and chemical biology.

The PhD program is designed for students who have earned a bachelor's or a master's degree in chemistry or related areas and who wish to earn a doctorate in chemistry. The program of study includes some course work, but the primary emphasis is on the completion of an original research project, its articulation in a well-written thesis, and its subsequent defense before the thesis (oral examination) committee.

The Master of Science in Biotechnology, a Professional Master of Science degree program, seeks to provide students with a common core of knowledge in biotechnology, with particular emphasis on their ability to integrate knowledge across disciplinary boundaries. Specific objectives are to provide students with didactic and practical knowledge in genomics, proteomics, and other bioanalytical approaches; drug discovery, development, and delivery; and bioprocess development and optimization.

Programs

Doctor of Philosophy (PhD)

- Chemistry (p. 345)
- Chemistry—Advanced Entry (p. 346)

Master of Science (MS)

- Biotechnology (p. 259)
- Chemistry (p. 348)

Graduate Certificate

- Biopharmaceutical Analytical Sciences (p. 266)
- Biotechnology (p. 349)
- Biotechnology Enterprise (p. 349)
- Experimental Biotechnology (p. 349)
- Molecular Biotechnology (p. 350)
- Pharmaceutical Technologies (p. 350)
- Process Science (p. 350)

Chemistry, PhD

The PhD program in chemistry is designed for students who have earned a bachelor's or a master's degree in chemistry or related areas and who wish to earn a doctorate in chemistry. Research spans a wide range of multidisciplinary fields, with strengths in clean energy, polymers, materials, medicinal chemistry, bioanalytical chemistry, and chemical biology. Our research programs draw from a strong foundation in analytical, organic, physical, and biological chemistry in a collaborative and diverse environment. Our student-focused approach to mentoring, a strong graduate student association, and faculty deeply rooted both in academics and industry provide a flexible platform for student development toward a large diversity of career paths.

Students typically take courses their first year while supported on teaching assistantships and achieve PhD candidacy the first or second half of year two. The primary emphasis of the program is on the

completion of an original research project, its articulation in a well-written thesis, and its subsequent defense before the thesis committee through an open seminar followed by oral examination by the committee members.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Three qualifying examinations
Annual review
Candidacy
Dissertation committee
Minimum of three seminars
Dissertation defense

General Requirements

Required Courses		
CHEM 5600	Research Skills and Ethics in Chemistry	3
CHEM 7730	Advanced Laboratory Methods	4
CHEM 7750	Advanced Problem Solving	3
CHEM 8504	Graduate Seminar (repeatable)	1
At least one seminar must be taken for a letter grade.		
CHEM 8984	Research	1-6
Chemistry Course Work		
Complete 18 semester hours from the following:		18
CHEM 5550, CHEM 5570, or within the range of CHEM 5610 to CHEM 7320		

Dissertation

Complete the following (repeatable) course twice:

CHEM 9990	Dissertation	0

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Chemistry, PhD—Advanced Entry

Advanced entry into the PhD program requires a master's degree in chemistry or a related area. Graduate courses taken during acquisition of the Master of Science degree allow completion of the PhD program with fewer course credits. Other than the course requirements, which are specified separately, see the PhD program requirements for details.

Industry Entry PhD

This program is strictly for students who already have a master's degree in chemistry or related area and have full-time employment at a company. The company must commit to all financial responsibilities accrued in obtaining the degree and allow time for the student to work on a PhD thesis in collaborative research with a company supervisor and one of our faculty members. Graduate courses in the Department of Chemistry and Chemical Biology are taught in the evenings to accommodate the fact that our students work in industry during the day.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Three qualifying examinations
Annual review
Candidacy
Dissertation committee
Minimum of three seminars
Dissertation defense

General Requirements

CHEM 5600	Research Skills and Ethics in Chemistry	3
CHEM 7750	Advanced Problem Solving	3
CHEM 8504	Graduate Seminar	1

Dissertation

Complete the following (repeatable) course twice:

CHEM 9990	Dissertation	0

Program Credit/GPA Requirements

7 total semester hours required
Minimum 3.000 GPA required

Biotechnology, MS

Overview

The Master of Science in Biotechnology is a Professional Master of Science (PSM) degree, an innovative graduate degree designed to allow students to pursue advanced training and excel in science while simultaneously developing highly valued business skills without acquiring a PhD or MBA. PSM programs are characterized by instruction in advanced science or mathematics, business courses, and a graduate co-op providing a real-world work experience. Graduates are referred to as "T-shaped" professionals with both deep knowledge of a specific discipline and broad knowledge of the communications and relational skills necessary to excel in any business and adapt to a changing workplace. The PSM is a nonthesis degree.

Molecular Biotechnology Concentration

The molecular biotechnology concentration provides students with didactic and practical knowledge in molecular biotechnology, protein expression, and structural biology. Students learn how to generate and optimize molecular forms used to express recombinant proteins to be used as biopharmaceuticals. Particular attention is paid to cutting-edge technologies such as RNAi and CRISPR/CAS9. In addition, the students learn how to purify biopharmaceuticals and analyze aggregation and how to prevent it.

Process Sciences Concentration

The process sciences concentration focuses on the production of drug substance of biopharmaceuticals from cell culture process to purification of the biologic molecules. The students learn the principles of development and implementation of biological manufacturing processes through the integration of concepts and fundamentals of engineering and life sciences. The concentration addresses biochemical engineering, mammalian cell culture process development, and protein purification. The learning of the students is reinforced by both lecture courses and project-driven laboratory experience that provides hands-on learning of cell culture and protein separation.

Biopharmaceutical Analytical Sciences Concentration

The biopharmaceutical analytical sciences concentration focuses on structures and activities of biological molecules and their variants formed

during the production of biopharmaceuticals. Students learn the diversity of molecular forms derived from the biological products through various biological and chemical mechanisms and the impact of these structural changes on the safety and efficacy of these biopharmaceuticals. The students learn the science and practice applied in the biotechnology industry to analyze and characterize these molecular forms. This is accomplished through both lecture courses of the analytical sciences and project-driven laboratory experience that utilizes analytical techniques such as mass spectrometry and molecular separations.

Pharmaceutical Technologies Concentration

The pharmaceutical technologies concentration focuses on the conversion of purified proteins to biopharmaceutical drug products that are compatible for clinical use. This concentration addresses the design of the product formulation and the development and implementation of the drug product manufacturing processes. Students learn the sciences of the interactions of the biologic molecules in the process conditions and the relevant process technology, such as aseptic operations and freeze-drying, needed for drug product manufacturing. This is accomplished through both lecture courses and project-driven laboratory experience that offers hands-on learning of formulation design and drug product process development.

Biotechnology Enterprise Concentration

The biotechnology enterprise concentration integrates business and management skills with the science of biotechnology. Students learn the fundamental concepts of leadership, entrepreneurship and innovation, financial decision making, and marketing. They gain teamwork, management, and business development skills in the process and graduate prepared to become scientist-managers.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

General Core		
BIOT 5120	Introduction to Biotechnology	3
BIOT 5219	The Biotechnology Enterprise	2
BIOT 5631	Cell Culture Processes for Biopharmaceutical Production	3
BIOL 6299	Molecular Cell Biology for Biotechnology	3
CHEM 5620	Protein Chemistry	3
CHEM 7317	Analytical Biotechnology	3
PHSC 6214	Experimental Design and Biostatistics	2
Co-op		
BIOT 6500	Professional Development for Co-op	0
BIOT 6964	Co-op Work Experience	0

Concentrations

Complete one of the following five concentrations:

- Biopharmaceutical Analytical Sciences Concentration (p. 260)
- Biotechnology Enterprise Concentration (p. 260)
- Molecular Biotechnology Concentration (p. 260)
- Pharmaceutical Technologies Concentration (p.)
- Process Sciences Concentration (p.)

BIOPHARMACEUTICAL ANALYTICAL SCIENCES CONCENTRATION

BIOT 5145	Basic Biotechnology Lab Skills	1
BIOT 7245	Biotechnology Applications Laboratory	3
CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis	3
CHEM 5616	Protein Mass Spectrometry	3
Electives (p. 260)		5

BIOTECHNOLOGY ENTERPRISE CONCENTRATION

BIOT 5225	Managing and Leading a Biotechnology Company	3
BIOT 5226	Biotechnology Entrepreneurship	3
BIOT 5227	Economics and Marketing for Biotechnology Managers	3
Electives (p. 260)		6

MOLECULAR BIOTECHNOLOGY CONCENTRATION

BIOT 5145	Basic Biotechnology Lab Skills	1
BIOT 5810	Cutting-Edge Applications in Molecular Biotechnology	3
BIOT 5850	Higher-Order Structure Analytics	3
BIOT 7245	Biotechnology Applications Laboratory	3
Electives (p. 260)		5

PHARMACEUTICAL TECHNOLOGIES CONCENTRATION

BIOT 5145	Basic Biotechnology Lab Skills	1
BIOT 5640	Drug Product Processes for Biopharmaceuticals	3
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations	3
BIOT 7245	Biotechnology Applications Laboratory	3
Electives (p. 260)		5

PROCESS SCIENCES CONCENTRATION

BIOT 5145	Basic Biotechnology Lab Skills	1
BIOT 5560	Bioprocess Fundamentals	3
BIOT 5635	Downstream Processes for Biopharmaceutical Production	3
BIOT 7245	Biotechnology Applications Laboratory	3
Electives (p. 260)		5

Elective List

Electives not on this list may be chosen with faculty advisor approval.

BINF 6308	Bioinformatics Computational Methods 1
BIOL 5100	Biology Colloquium
BIOL 5307	Biological Electron Microscopy
BIOL 5499	Plant Biotechnology
BIOL 5543	Stem Cells and Regeneration
BIOL 5549	Microbial Biotechnology
BIOL 5569	Advanced Microbiology
BIOL 5573	Medical Microbiology
BIOL 5581	Biological Imaging
BIOL 5583	Immunology
BIOL 6381	Ethics in Biological Research
BIOL 6399	Dynamics of Microbial Ecology

BIOL 7303	Structural Biology
BIOL 7382	Research Problem Solving
BIOL 7383	Topics in Biochemistry Cell and Molecular Biology
BIOL 7384	Topics in Integrative Biology
BIOT 5220	The Role of Patents in the Biotechnology Industry, Past and Future
BIOT 5225	Managing and Leading a Biotechnology Company
BIOT 5226	Biotechnology Entrepreneurship
BIOT 5227	Economics and Marketing for Biotechnology Managers
BIOT 5330	Drug Safety and Immunogenicity
BIOT 5560	Bioprocess Fundamentals
BIOT 5635	Downstream Processes for Biopharmaceutical Production
BIOT 5640	Drug Product Processes for Biopharmaceuticals
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations
BIOT 7300	Special Topics in Biotechnology
BIOT 7303	Special Topics in Biopharmaceutical Regulatory Science
CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis
CHEM 5616	Protein Mass Spectrometry
CHEM 5617	Protein Mass Spectrometry Laboratory
CHEM 5621	Principles of Chemical Biology for Chemists
CHEM 5625	Chemistry and Design of Protein Pharmaceuticals
CHEM 5638	Molecular Modeling
CHEM 5639	Chemical Kinetics
CHEM 5644	Principles and Analysis of Carbohydrates
CHEM 5646	Synthesis and Reactivity of Inorganic Compounds
CHEM 5687	Principles of Solid State Chemistry
CHEM 7247	Advances in Nanomaterials
CHME 5260	Special Topics in Chemical Engineering
CHME 7340	Chemical Engineering Kinetics
ENTR 6200	Enterprise Growth and Innovation
ENTR 6210	Managing Operations in Early Stage Ventures
ENTR 6211	Entrepreneurship: Services and Retail Business Creation
ENTR 6212	Business Planning for New Ventures
HINF 5105	The American Healthcare System
HINF 6201	Organizational Behavior, Work Flow Design, and Change Management
MGMT 6210	Law for Managers and Entrepreneurs
MGSC 6200	Information Analysis
NNMD 5270	Introduction to Nanomedicine Science and Technology
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market
NRSG 6800	Introduction to Industry Research Guidelines
PHSC 6212	Research Skills and Ethics
PHSC 6218	Biomedical Chemical Analysis
PHSC 6222	The Chemistry and Biology of Drugs of Abuse
PHSC 6224	Behavioral Pharmacology and Drug Discovery
PHSC 6226	Imaging in Medicine and Drug Discovery
PHSC 6290	Biophysical Methods in Drug Discovery
PHSC 7010	Pharmaceutical Sciences Laboratory
TECE 6260	Measuring and Managing the Cost of Production and Growth
TECE 6230	Entrepreneurial Marketing and Selling
TECE 6250	Lean Design and Development
TOXC 5578	Biochemical Toxicology Lab

Program Credit/GPA Requirements

34 total semester hours required
Minimum 3.000 GPA required

Chemistry, MS

Part-time Master's

The Department of Chemistry and Chemical Biology offers a part-time, course-based master's degree. Classes are offered in the evenings to accommodate students who have full-time jobs. A research thesis is not a requirement for the degree.

Master's

The department does not accept applications for the thesis-based master's degree from students who are not already at Northeastern.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 30 semester hours from the following courses:		30
CHEM 5550–CHEM 7750		

THESIS OPTION

Course Work		
Complete 18 semester hours from the following:		18
CHEM 5550, CHEM 5570, or within the range of CHEM 5610 to CHEM 7320		
Graduate Seminar (letter grade required)		
CHEM 5904	Seminar	1
or CHEM 8504	Graduate Seminar	
Skills and Ethics		
CHEM 5600	Research Skills and Ethics in Chemistry	3
Laboratory		

CHEM 7730	Advanced Laboratory Methods	4
Research		
CHEM 5984	Research	4
or CHEM 8984	Research	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Biopharmaceutical Analytical Sciences, Graduate Certificate

The Graduate Certificate in Biopharmaceutical Analytical Sciences has been designed in response to a need in the biotechnology industry for individuals with an advanced knowledge of the principles and practices of state-of-the-art analyses of protein with focus on the characterization of innovator and biosimilars. Individuals, particularly those who are working in the various sectors of biotechnology including basic research of biological systems, discovery, development, and manufacturing of biopharmaceuticals, have an opportunity to improve their competency and learn new practical skills that enable them to increase productivity and further contribute to their professions. In addition, the certificate was designed for both individuals with and without experience in biopharmaceuticals and their analysis.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

CHEM 5616	Protein Mass Spectrometry	3
CHEM 5617	Protein Mass Spectrometry Laboratory	3
CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis	3
CHEM 5660	Analytical Biochemistry	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Biotechnology, Graduate Certificate

The graduate certificate in biotechnology has been designed in response to a need in the biotechnology industry for individuals without a biotechnology background to obtain a strong foundation in basic biotechnology concepts and skills. Individuals, particularly those who are working in fields other than biotechnology, will acquire competency and learn new practical skills enabling them to increase productivity and allow for transitions into more biotechnology-related fields.

Program Requiements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C- or higher is required in all courses.

BIOT 5120	Introduction to Biotechnology	3
BIOT 5631	Cell Culture Processes for Biopharmaceutical Production	3
BIOL 6299	Molecular Cell Biology for Biotechnology	3
CHEM 5620	Protein Chemistry	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Biotechnology Enterprise, Graduate Certificate

The graduate certificate in biotechnology enterprise has been designed in response to a need in the biotechnology industry for individuals with a biotechnology background to obtain a strong foundation in the business aspects of biotechnology. Individuals, particularly those who are working in the field of biotechnology, will improve their business competency enabling them to better manage a team or move into a more business-orientated roll.

Program Requiements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C- or higher is required in all courses.

BIOT 5225	Managing and Leading a Biotechnology Company	3
BIOT 5226	Biotechnology Entrepreneurship	3
BIOT 5227	Economics and Marketing for Biotechnology Managers	3
CHEM 7317	Analytical Biotechnology	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Experimental Biotechnology, Graduate Certificate

The graduate certificate in experimental biotechnology has been designed in response to a need in the biotechnology industry for individuals without a biotechnology background to obtain a strong foundation in lab-based, hands-on, biotechnology skills. Individuals, particularly those who are working in fields other than biotechnology, will acquire competency and learn new practical lab skills enabling them to increase productivity and transition into more biotechnology-related fields.

Program Requiements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C– or higher is required in all courses.

BIOL 5549	Microbial Biotechnology	4
BIOT 5219	The Biotechnology Enterprise	2
BIOT 5145	Basic Biotechnology Lab Skills	1
BIOT 7245	Biotechnology Applications Laboratory	3
PHSC 6214	Experimental Design and Biostatistics	2

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Molecular Biotechnology, Graduate Certificate

The graduate certificate in molecular biotechnology has been designed in response to a need in the biotechnology industry for individuals with an advanced knowledge of the principles and practices of state-of-the-art molecular biology techniques and advanced protein structure analysis. Individuals, particularly those who are working in the various sectors of biotechnology including basic research of biological systems, discovery, development and manufacturing of biopharmaceuticals, will improve improve their competency and learn new practical skills enabling them to increase productivity and further contribute to their professions.

Program Requiements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C- or higher is required in all courses.

BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations	3
BIOT 5810	Cutting-Edge Applications in Molecular Biotechnology	3
BIOT 5850	Higher-Order Structure Analytics	3
CHEM 7317	Analytical Biotechnology	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Pharmaceutical Technologies, Graduate Certificate

The Graduate Certificate in Pharmaceutical Technology has been designed in response to a need in the biotechnology industry for individuals with an advanced knowledge of the principles and practices of the stages of drug development, biopharmaceutical development. Individuals, particularly those who are working in the various sectors of biotechnology including basic research of biological systems, discovery, development, and manufacturing of biopharmaceuticals, will improve their competency and learn new practical skills enabling them to increase productivity and further contribute to their professions.

Program Requiements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C– or higher is required in all courses.

BIOT 5640	Drug Product Processes for Biopharmaceuticals	3
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations	3
CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis	3
CHEM 7317	Analytical Biotechnology	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Process Science, Graduate Certificate

The graduate certificate in process sciences has been designed in response to a need in the biotechnology industry for individuals with an advanced knowledge of the principles and practices of process development of biopharmaceuticals. Individuals, particularly those who are working in the various sectors of biotechnology including basic research of biological systems, discovery, development and manufacturing of biopharmaceuticals, will improve their competency and learn new practical skills enabling them to increase productivity and further contribute to their professions.

Program Requiements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

A grade of C- or higher is required in all courses.

BIOT 5560	Bioprocess Fundamentals	3
BIOT 5635	Downstream Processes for Biopharmaceutical Production	3
BIOT 5640	Drug Product Processes for Biopharmaceuticals	3
CHEM 7317	Analytical Biotechnology	3

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Marine and Environmental Sciences

Website (http://www.northeastern.edu/mes)

Geoffrey C. Trussell, PhD
Professor and Chair

Marine Science Center
781.581.7370
781.581.6076 (fax)
gradmes@northeastern.edu

Jonathan Grabowski, PhD
Associate Professor and Director of Graduate Studies,
j.grabowski@northeastern.edu

David Dawson, Academic Program Assistant,
d.dawson@northeastern.edu (c.shockley@northeastern.edu)
617.373.2059

The Department of Marine and Environmental Sciences graduate program offerings include core capacities in marine biology, ecology, and evolution. Students benefit from top-notch research facilities at both the Marine Science Center and the main campus in Boston. The MS program in marine biology seeks to prepare students for entry- and mid-level careers in marine research. The PhD program in ecology, evolution, and marine biology is designed to prepare graduates for careers in academia, government agencies, and the private sector.

Programs

Doctor of Philosophy (PhD)

- Ecology, Evolution, and Marine Biology (p. 351)
- Ecology, Evolution, and Marine Biology—Advanced Entry (p. 351)

Master of Science (MS)

- Marine Biology—Three Seas Program (p. 352)

Ecology, Evolution, and Marine Biology, PhD

The PhD in Ecology, Evolution, and Marine Biology (EEMB) program provides students with advanced course work and training in ecology, evolution, and marine biology. For students entering with a bachelor's degree, EEMB program completion requires 30 semester hours of graduate-level course work, of which 20 semester hours must carry a letter grade. The remaining 10 semester hours must consist of colloquia, doctoral research, and approved graduate courses. Planned course work must be approved by the student's dissertation committee.

Students must pass three examinations during the course of their graduate studies:

1. A written examination consisting of questions posed by the student's written examination committee.
2. An oral examination by the student's dissertation committee consisting of an oral presentation and defense of the student's dissertation proposal and including questions about the research areas that the student proposes to work in.
3. A defense of the student's written dissertation consisting of a public seminar, public question-and-answer period, and private defense of their work to their dissertation committee. Dissertation committees consist of at least four Northeastern faculty and one external faculty member.

A cumulative GPA of 3.000 is required for graduation. All PhD students are required to have at least one first-authored publication submitted to or accepted in a peer-reviewed journal prior to their defense. The PhD will be awarded following submission of a dissertation, approved by the candidate's dissertation committee, to the College of Science.

Students who are admitted to the PhD program, complete the course work component of the curriculum, and prepare and defend a written thesis (as opposed to a more comprehensive dissertation) may, at the discretion of the graduate committee and their dissertation committee, be awarded a master's degree (Master of Science in Ecology, Evolution, and Marine Biology). The MS degree will only be awarded in rare instances when students and/or their dissertation committee, after communication with the graduate committee, determine that the PhD is untenable.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Candidacy
Dissertation committee
Dissertation proposal
First-author publication
Dissertation defense

Required Course Work

Colloquium		
Complete the following (repeatable) course twice:		2
EEMB 7100	Colloquium	
Approved Graduate-Level Courses		
Complete 28 semester hours from the following; 20 semester hours must carry a letter grade:		28
BIOL 5000 to BIOL 9000		
ENVR 5000 to ENVR 9000		
EEMB 5000 to EEMB 9000		
EEMB 8982	Readings	
EEMB 8984	Research	

Dissertation

Complete the following (repeatable) course twice:		
EEMB 9990	Dissertation	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Ecology, Evolution, and Marine Biology, PhD—Advanced Entry

The PhD in Ecology, Evolution, and Marine Biology (EEMB) program provides students with advanced course work and training in ecology, evolution, and marine biology. Students admitted with a master's degree must take two semesters of colloquium. Transcripts detailing their previous course work will be submitted upon arrival to their dissertation committee and the marine and environmental sciences graduate committee to determine whether additional course work is required. The dissertation committee may require the student to pursue additional course work as needed to provide the necessary background for their program of study. Additional course work may also be required depending on the student's performance on written qualifying and oral examinations.

Students must pass three examinations during the course of their graduate studies:

1. A written examination consisting of questions posed by the student's written examination committee.
2. An oral examination by the student's dissertation committee consisting of an oral presentation and defense of the student's dissertation proposal and including questions about the research areas that the student proposes to work in.
3. A defense of the student's written dissertation consisting of a public seminar, public question-and-answer period, and private defense of their work to their dissertation committee. Dissertation committees consist of at least four Northeastern faculty and one external faculty member.

A cumulative GPA of 3.000 is required for graduation. All PhD students are required to have at least one first-authored publication submitted to or accepted in a peer-reviewed journal prior to their defense. The PhD will be awarded following submission of a dissertation, approved by the candidate's dissertation committee, to the College of Science.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Candidacy
Dissertation committee
Dissertation proposal
Dissertation proposal defense
First-author publication
Dissertation defense

Requirements

EEMB 8986	Research	0
Complete the following (repeatable) course twice:		2
EEMB 7100	Colloquium	

Dissertation

Complete the following (repeatable) course twice:		
EEMB 9990	Dissertation	

Program Credit/GPA Requirements

2 total semester hours required
Minimum 3.000 GPA required

Marine Biology, MS—Three Seas Program

The MS in Marine Biology—Three Seas Program provides students the opportunity to study marine biology in three distinct environments at three world-renowned research facilities in New England, the Caribbean, and the Pacific Northwest. An internship in the field and independent research project provide the capstone to the fifteen-month graduate program.

Much more than course work in a classroom, the MS in Marine Biology—Three Seas Program delivers inquiry-based curriculum in marine science during which our students formulate research questions, design and conduct critical experiments, and interpret and present results. You will have an opportunity not only learn science, you have an opportunity to learn how to do science and become a marine scientist.

This program is for students eager to broaden their knowledge of marine biology or who want to further refine their interests.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

YEAR 1

Students register for International Study—Three Seas Program (ABRS 5120) for the fall and spring terms of year 1.

Fall Term		
EEMB 5303	Marine Biology Careers Seminar	1
EEMB 5516 and EEMB 5517	Oceanography and Lab for EEMB 5516	5
EEMB 5522 and EEMB 5523	Experimental Design Marine Ecology and Lab for EEMB 5522	5
EEMB 5534 and EEMB 5535	Marine Invertebrate Zoology and Botany and Lab for EEMB 5534	5
EEMB 5536	Ocean and Coastal Sustainability	3
EEMB 5589	Diving Research Methods	2
Spring Term		
EEMB 5504	Biology of Corals	3
EEMB 5506	Biology and Ecology of Fishes	3
EEMB 5508 and EEMB 5509	Marine Birds and Mammals and Lab for EEMB 5508	3
EEMB 5512	Tropical Terrestrial Ecology	1
EEMB 5518	Ocean and Coastal Processes	2
EEMB 5520	Coral Reef Ecology	2
EEMB 5528	Marine Conservation Biology	3
EEMB 5532	Physiological and Molecular Marine Ecology	3

YEAR 2

Fall Term		
EEMB 8674	Marine Biology Research Project	1

Program Credit/GPA Requirements

43 total semester hours required
Minimum 3.000 GPA required

Mathematics

Website (http://www.northeastern.edu/cos/mathematics)

Christopher K. King, PhD
Professor and Chair

567 Lake Hall
617.373.2450
617.373.5658 (fax)

Maxim Braverman, PhD
Professor and Director of Graduate Studies,
m.braverman@northeastern.edu

Chantal Cardona, Administrative Assistant, c.cardona@northeastern.edu (c.shockley@northeastern.edu), 617.373.2454

Graduate Programs Website (http://www.math.neu.edu/graduate-programs)

The graduate programs offer MS and PhD degrees in mathematics, as well as an MS degree in operations research and an MS degree in applied mathematics. The programs are designed to provide students with a broad overview of current mathematics and a strong command of an area of specialization.

The Master of Science Degree

This program offers students with a bachelor's degree in mathematics or a related field an opportunity to broaden their knowledge in the several fields of mathematics and its applications. The program is designed to prepare graduates for careers in business, industry, or government.

The Doctor of Philosophy Degree

TRACKS

- Pure mathematics
- Discrete mathematics

- Probability/statistics

Programs

Doctor of Philosophy (PhD)

- Mathematics (p. 353)
- Mathematics—Advanced Entry (p. 355)

Master of Science (MS)

- Applied Mathematics (p. 358)
- Mathematics (p. 358)

Master of Science in Operations Research (MSOR)

- Operations Research (p. 359)

Mathematics, PhD

Course Requirements

Students entering with a bachelor's degree are required to take 64 semester hours of course work divided between foundational and advanced offerings. Students entering the program will be allowed to place out of some (possibly all) of the eight basic-level courses; the graduate coordinator together with the first-year graduate advisor will determine the allowable course substitutions and will advise the student which foundational courses to take. Students may satisfy requirements for Algebra 1 (MATH 5111) and Analysis 1: Functions of One Variable (MATH 5101) by taking qualifying exams in algebra 1 and in analysis 1 at the start of the program. Students may satisfy foundational course requirements if they demonstrate proficiency by passing an assessment exam in the course at the beginning of the semester or by demonstrating that they have taken a similar course and have adequate knowledge of the course material (syllabus and transcript are required; a brief oral examination is also required in that case). Academic advising will happen just before the start of each term and during the add/drop period in order to plan a student's course registration for the term. A complete listing of foundational and advanced courses is available from the Department of Mathematics and the graduate dean's office. Students are not permitted to register for more than two "readings" courses and three "topics" courses for credit toward the degree without explicit permission from the graduate dean. A minimum grade-point average (GPA) of 3.000 is required for degree conferral.

Teaching Requirement

Some teaching experience is required while in the program. Students must attend university-led TA training at the start of the program; attend a one-semester TA training course conducted by faculty from the Department of Mathematics teaching committee; spend one semester shadowing faculty in the undergraduate classroom; and perform recitations and grading for the undergraduate course they are shadowing.

Qualifying Exams

Qualifying exam sessions are given once in spring and once in fall. Students will be required to pass four qualifying exams: algebra 1, analysis 1, and two other exams. The possible additional topics for qualifying exams are algebra 2, analysis 2, combinatorics, geometry, ordinary differential equations, partial differential equations, probability, statistics, topology, and algebraic geometry. A qualifying exam may be taken twice by any student. Additional attempts may be allowed at the discretion of the graduate committee with permission from the graduate dean in the College of Science. Two qualifying exams should be passed no later than the end of the second year and all four by the end of the third year.

Doctoral Candidacy

PhD candidacy is reached when all of the following conditions are met:

- Completion of eight advanced courses
- Identification of an unsolved research problem
- Successful passing of four qualifying exams
- Assignment of PhD supervisor and creation of a 1-page initial plan
- Completion of a 3-page plan of research
- Completion of a 10-page progress report and a one-hour defense of proposal, presented to supervisor and three faculty members of graduate committee

Dissertation Requirement

Each candidate must complete a dissertation that embodies the results of extended research and makes an original contribution to the field. This work should give evidence of the candidate's ability to carry out independent investigation and interpret, in a logical manner, the results of the research. There are two stages to this process:

- **Stage 1:** Students in the PhD program must have a dissertation supervisor within two years after joining the PhD program. The department views the failure of a student to find a supervisor within two years of joining the PhD program with concern and considers this sufficient cause to review the student's status in the PhD program. The process of obtaining a dissertation supervisor always involves two choices—the student chooses the supervisor, and the supervisor chooses the student. For this reason, the department does not guarantee a dissertation supervisor for every student, but the department recognizes its responsibility to help the student find a satisfactory match. This aid is usually provided by the student's graduate advisor, who should be familiar with the student's progress in finding a dissertation supervisor. The dissertation supervisor guides the student's further education as well as directs the student's dissertation. The dissertation itself must represent an original solution of a problem in the chosen area of mathematics that makes a significant contribution to the mathematical knowledge in that area. Students must enroll in Dissertation or Dissertation Continuation while fulfilling the dissertation requirements.
- **Stage 2 (dissertation defense):** The final oral examination on the dissertation is held in accordance with university regulations and given by a dissertation committee of four faculty members (three from the university, including the supervisor, and one from outside Northeastern University). The dissertation supervisor should propose this dissertation committee to the graduate committee for its approval at least one month before the PhD dissertation defense.

Program Requirements

Bachelor's Degree Entry

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Four qualifying examinations
Annual review
Dissertation committee
Teaching requirement
Doctoral candidacy
Progress report and presentation
Dissertation defense

Prerequisites

Algebra and Analysis

MATH 5101	Analysis 1: Functions of One Variable	4
MATH 5111	Algebra 1	4

Tracks

Complete one of the following three tracks:

- Pure Track (p. 354)
- Discrete Track (p. 354)
- Probability and Statistics Track (p. 354)

PURE TRACK

Analysis

MATH 5102	Analysis 2: Functions of Several Variables	4
or MATH 7232	Combinatorial Analysis	

Algebra

MATH 5112	Algebra 2	4
or MATH 7314	Algebraic Geometry 1	

Foundational Courses

Complete up to 16 semester hours from the following:		16
MATH 5104	Basics and Probability and Statistics	
MATH 5105	Basics of Statistics and Stochastic Processes	
MATH 5106	Basics of Complex Analysis	
MATH 5107	Basics of Number Theory	
MATH 5108	Methods for Teaching Math	
MATH 5121	Topology 1	
MATH 5122	Geometry 1	
MATH 5976	Directed Study	
MATH 5978	Independent Study	
MATH 5984	Research	
MATH 7201	Ordinary Differential Equations	
MATH 7203	Numerical Analysis 1	
MATH 7205	Numerical Analysis 2	
MATH 7221	Topology 2	
MATH 7222	Geometry 2	
MATH 7232	Combinatorial Analysis	
MATH 7233	Graph Theory	
MATH 7235	Discrete Geometry 1	
MATH 7241	Probability 1	
MATH 7245	Statistics for Health Sciences	
MATH 7260	History of Mathematics	
MATH 7314	Algebraic Geometry 1	
MATH 7341	Probability 2	
MATH 7342	Mathematical Statistics	
MATH 7343	Applied Statistics	

Advanced Course Work

Complete 32 semester hours from the advanced course work list. Only two readings and three topics courses are allowed. (p. 355)		32

DISCRETE TRACK

Algebra

MATH 5112	Algebra 2	4
or MATH 7232	Combinatorial Analysis	

Probability

MATH 7241	Probability 1	4

Foundational Courses

Complete up to 16 semester hours from the following:		16
MATH 5102	Analysis 2: Functions of Several Variables	
MATH 5104	Basics and Probability and Statistics	
MATH 5105	Basics of Statistics and Stochastic Processes	
MATH 5106	Basics of Complex Analysis	
MATH 5107	Basics of Number Theory	
MATH 5108	Methods for Teaching Math	
MATH 5111	Algebra 1	
MATH 5112	Algebra 2	
MATH 5121	Topology 1	
MATH 5122	Geometry 1	
MATH 5976	Directed Study	
MATH 5978	Independent Study	
MATH 5984	Research	
MATH 7201	Ordinary Differential Equations	
MATH 7203	Numerical Analysis 1	
MATH 7205	Numerical Analysis 2	
MATH 7221	Topology 2	
MATH 7222	Geometry 2	
MATH 7232	Combinatorial Analysis	
MATH 7233	Graph Theory	
MATH 7235	Discrete Geometry 1	
MATH 7245	Statistics for Health Sciences	
MATH 7260	History of Mathematics	
MATH 7314	Algebraic Geometry 1	
MATH 7341	Probability 2	
MATH 7342	Mathematical Statistics	
MATH 7343	Applied Statistics	

Advanced Course Work

Complete 32 semester hours from the advanced course work list. Only two readings and three topics courses are allowed. (p. 355)		32

PROBABILITY AND STATISTICS TRACK

Analysis

Complete 4 semester hours from the following:		4
MATH 5102	Analysis 2: Functions of Several Variables	
MATH 7203	Numerical Analysis 1	
MATH 7232	Combinatorial Analysis	

Probability

MATH 7241	Probability 1	4
or MATH 7342	Mathematical Statistics	

Foundational Courses

Complete up to 16 semester hours from the following:		16
MATH 5102	Analysis 2: Functions of Several Variables	
MATH 5104	Basics and Probability and Statistics	
MATH 5105	Basics of Statistics and Stochastic Processes	
MATH 5106	Basics of Complex Analysis	

MATH 5107	Basics of Number Theory
MATH 5108	Methods for Teaching Math
MATH 5112	Algebra 2
MATH 5121	Topology 1
MATH 5122	Geometry 1
MATH 5976	Directed Study
MATH 5978	Independent Study
MATH 5984	Research
MATH 7201	Ordinary Differential Equations
MATH 7203	Numerical Analysis 1
MATH 7205	Numerical Analysis 2
MATH 7221	Topology 2
MATH 7222	Geometry 2
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory
MATH 7235	Discrete Geometry 1
MATH 7241	Probability 1
MATH 7245	Statistics for Health Sciences
MATH 7260	History of Mathematics
MATH 7314	Algebraic Geometry 1
MATH 7341	Probability 2
MATH 7342	Mathematical Statistics
MATH 7343	Applied Statistics

Advanced Course Work

Complete 32 semester hours from the advanced course work list. Only two readings and three topics courses are allowed. (p. 355)	32

Advanced Course Work List

MATH 7204	Complex Analysis
MATH 7213	Algebra 3: Galois Theory
MATH 7234	Optimization and Complexity
MATH 7301	Functional Analysis
MATH 7302	Partial Differential Equations 2
MATH 7303	Complex Manifolds
MATH 7311	Commutative Algebra
MATH 7312	Lie Theory
MATH 7313	Representation Theory
MATH 7315	Algebraic Number Theory
MATH 7316	Lie Algebras
MATH 7321	Topology 3
MATH 7322	Geometry 3
MATH 7323	Differential Geometry 1
MATH 7324	Differential Geometry 2
MATH 7331	Algebraic Combinatorics
MATH 7335	Discrete Geometry 2
MATH 7344	Regression, ANOVA, and Design
MATH 7345	Nonparametric Methods in Statistics
MATH 7346 to MATH 7392	
MATH 7976 to MATH 8986	
MATH 9948	Modern Mathematical Research
MATH 9984	Research
MATH 9986	Research
MATH 7721	Readings in Topology
MATH 7722	Readings in Algebraic Topology
MATH 7723	Readings in Geometric Topology
MATH 7725	Readings in Singularities
MATH 7730	Readings in Combinatorics
MATH 7731	Readings in Combinatorics and Algebra
MATH 7732	Readings in Combinatorial Geometry
MATH 7733	Readings in Graph Theory
MATH 7734	Readings in Algebra
MATH 7735	Readings in Algebraic Geometry
MATH 7736	Readings in Discrete Geometry
MATH 7737	Readings in Commutative Algebra
MATH 7741	Readings in Probability and Statistics
MATH 7751	Readings: Analysis
MATH 7752	Readings in Real Analysis
MATH 7753	Readings in Geometric Analysis
MATH 7754	Readings in Ordinary Differential Equations
MATH 7755	Readings in Partial Differential Equations
MATH 7771	Readings in Geometry
MATH 7772	Readings in Coding Theory

Dissertation

Complete the following (repeatable) course twice:

MATH 9990	Dissertation

Program Credit/GPA Requirements

64 total semester hours required
Minimum 3.000 GPA required

Mathematics, PhD—Advanced Entry

Course Requirements

Advanced students who enter the PhD program with a master's degree (or equivalent) will be allowed to place out of some (possibly all) of the eight basic-level courses; the graduate coordinator together with the first-year graduate advisor will determine the allowable course substitutions and will advise the student which foundational courses to take. Students may satisfy requirements for Algebra 1 (Algebra 1 (MATH 5111) and Analysis 1: Functions of One Variable (MATH 5101)) by taking qualifying exams in algebra 1 and in analysis 1 at the start of the program. Students may satisfy foundational course requirements if they demonstrate proficiency by passing an assessment exam in the course at the beginning of the semester or by demonstrating that they have taken a similar course and have adequate knowledge of the course material (syllabus and transcript are required; a brief oral examination is also required in that case). Academic advising will happen just before the start of each term and during the add/drop period in order to plan a student's course registration for the term. A complete listing of foundational and advanced courses is available from the Department of Mathematics and the graduate dean's office. Students are not permitted to register for more than two "readings" courses and three "topics" courses for credit toward the degree without explicit permission from the graduate dean. A minimum grade-point average (GPA) of 3.000 is required for degree conferral.

Teaching Requirement

Some teaching experience is required while in the program. Students must attend university-led TA training at the start of the program;

attend a one-semester TA training course conducted by faculty from the Department of Mathematics teaching committee; spend one semester shadowing faculty in the undergraduate classroom; and perform recitations and grading for the undergraduate course they are shadowing.

Qualifying Exams

Qualifying exam sessions are given once in spring and once in fall. Students will be required to pass four qualifying exams: algebra 1, analysis 1, and two other exams. The possible additional topics for qualifying exams are algebra 2, analysis 2, combinatorics, geometry, ordinary differential equations, partial differential equations, probability, statistics, topology, and algebraic geometry. A qualifying exam may be taken twice by any student. Additional attempts may be allowed at the discretion of the graduate committee with permission from the graduate dean in the College of Science. Two qualifying exams should be passed no later than the end of the second year and all four by the end of the third year.

Doctoral Candidacy

PhD candidacy is reached when all of the following conditions are met:

- Completion of eight advanced courses
- Identification of an unsolved research problem
- Successful passing of four qualifying exams
- Assignment of PhD supervisor and creation of a 1-page initial plan
- Completion of a 3-page plan of research
- Completion of a 10-page progress report and a one-hour defense of proposal, presented to supervisor and three faculty members of graduate committee

Dissertation Requirement

Each candidate must complete a dissertation that embodies the results of extended research and makes an original contribution to the field. This work should give evidence of the candidate's ability to carry out independent investigation and interpret, in a logical manner, the results of the research. There are two stages to this process:

- **Stage 1:** Students in the PhD program must have a dissertation supervisor within two years after joining the PhD program. The department views the failure of a student to find a supervisor within two years of joining the PhD program with concern and considers this sufficient cause to review the student's status in the PhD program. The process of obtaining a dissertation supervisor always involves two choices—the student chooses the supervisor, and the supervisor chooses the student. For this reason, the department does not guarantee a dissertation supervisor for every student, but the department recognizes its responsibility to help the student find a satisfactory match. This aid is usually provided by the student's graduate advisor, who should be familiar with the student's progress in finding a dissertation supervisor. The dissertation supervisor guides the student's further education as well as directs the student's dissertation. The dissertation itself must represent an original solution of a problem in the chosen area of mathematics that makes a significant contribution to the mathematical knowledge in that area. Students must enroll in Dissertation or Dissertation Continuation while fulfilling the dissertation requirements.
- **Stage 2 (dissertation defense):** The final oral examination on the dissertation is held in accordance with university regulations and given by a dissertation committee of four faculty members (three from the university, including the supervisor, and one from outside Northeastern University). The dissertation supervisor should propose this dissertation committee to the graduate committee for its approval at least one month before the PhD dissertation defense.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Four qualifying examinations
Annual review
Dissertation committee
Teaching requirement
Doctoral candidacy
Progress report and presentation
Dissertation defense

Complete 0–16 semester hours of the following courses:		
MATH 5101	Analysis 1: Functions of One Variable	4
MATH 5102	Analysis 2: Functions of Several Variables	4
MATH 5111	Algebra 1	4
MATH 5112	Algebra 2	4

Tracks

Complete one of the following three tracks:

- Pure Track (p. 356)
- Discrete Track (p. 357)
- Probability and Statistics Track (p. 357)

PURE TRACK

Foudational Courses

Complete 0–16 semester hours from the following:		0-16
MATH 5104	Basics and Probability and Statistics	
MATH 5105	Basics of Statistics and Stochastic Processes	
MATH 5106	Basics of Complex Analysis	
MATH 5107	Basics of Number Theory	
MATH 5108	Methods for Teaching Math	
MATH 5121	Topology 1	
MATH 5122	Geometry 1	
MATH 5976	Directed Study	
MATH 5978	Independent Study	
MATH 5984	Research	
MATH 7201	Ordinary Differential Equations	
MATH 7203	Numerical Analysis 1	
MATH 7205	Numerical Analysis 2	
MATH 7221	Topology 2	
MATH 7222	Geometry 2	
MATH 7232	Combinatorial Analysis	
MATH 7233	Graph Theory	
MATH 7235	Discrete Geometry 1	
MATH 7241	Probability 1	
MATH 7245	Statistics for Health Sciences	
MATH 7260	History of Mathematics	
MATH 7314	Algebraic Geometry 1	
MATH 7341	Probability 2	
MATH 7342	Mathematical Statistics	

MATH 7343	Applied Statistics

Advanced Course Work

Complete 32 semester hours from the advanced course work list. Only two readings and three topics courses are allowed. (p. 357) 32

DISCRETE TRACK

Foundational Courses

Complete 0–16 semester hours from the following:		0 - 16
MATH 5102	Analysis 2: Functions of Several Variables	
MATH 5104	Basics and Probability and Statistics	
MATH 5105	Basics of Statistics and Stochastic Processes	
MATH 5106	Basics of Complex Analysis	
MATH 5107	Basics of Number Theory	
MATH 5108	Methods for Teaching Math	
MATH 5111	Algebra 1	
MATH 5112	Algebra 2	
MATH 5121	Topology 1	
MATH 5122	Geometry 1	
MATH 5976	Directed Study	
MATH 5978	Independent Study	
MATH 5984	Research	
MATH 7201	Ordinary Differential Equations	
MATH 7203	Numerical Analysis 1	
MATH 7205	Numerical Analysis 2	
MATH 7221	Topology 2	
MATH 7222	Geometry 2	
MATH 7232	Combinatorial Analysis	
MATH 7233	Graph Theory	
MATH 7235	Discrete Geometry 1	
MATH 7245	Statistics for Health Sciences	
MATH 7260	History of Mathematics	
MATH 7314	Algebraic Geometry 1	
MATH 7341	Probability 2	
MATH 7342	Mathematical Statistics	
MATH 7343	Applied Statistics	

Advanced Course Work

Complete 32 semester hours from the advanced course work list. Only two readings and three topics courses are allowed. (p. 357) 32

PROBABILITY AND STATISTICS TRACK

Foundational Courses

Complete 0–16 semester hours from the following:		0 - 16
MATH 5102	Analysis 2: Functions of Several Variables	
MATH 5104	Basics and Probability and Statistics	
MATH 5105	Basics of Statistics and Stochastic Processes	
MATH 5106	Basics of Complex Analysis	
MATH 5107	Basics of Number Theory	
MATH 5108	Methods for Teaching Math	
MATH 5112	Algebra 2	
MATH 5121	Topology 1	
MATH 5122	Geometry 1	
MATH 5976	Directed Study	
MATH 5978	Independent Study	
MATH 5984	Research	
MATH 7201	Ordinary Differential Equations	
MATH 7203	Numerical Analysis 1	
MATH 7205	Numerical Analysis 2	
MATH 7221	Topology 2	
MATH 7222	Geometry 2	
MATH 7232	Combinatorial Analysis	
MATH 7233	Graph Theory	
MATH 7235	Discrete Geometry 1	
MATH 7241	Probability 1	
MATH 7245	Statistics for Health Sciences	
MATH 7260	History of Mathematics	
MATH 7314	Algebraic Geometry 1	
MATH 7341	Probability 2	
MATH 7342	Mathematical Statistics	
MATH 7343	Applied Statistics	

Advanced Course Work

Complete 32 semester hours from the advanced course work list. Only two readings and three topics courses are allowed. (p. 357) 32

Advanced Course Work List

MATH 7204	Complex Analysis
MATH 7213	Algebra 3: Galois Theory
MATH 7234	Optimization and Complexity
MATH 7301	Functional Analysis
MATH 7302	Partial Differential Equations 2
MATH 7303	Complex Manifolds
MATH 7311	Commutative Algebra
MATH 7312	Lie Theory
MATH 7313	Representation Theory
MATH 7315	Algebraic Number Theory
MATH 7316	Lie Algebras
MATH 7321	Topology 3
MATH 7322	Geometry 3
MATH 7323	Differential Geometry 1
MATH 7324	Differential Geometry 2
MATH 7331	Algebraic Combinatorics
MATH 7335	Discrete Geometry 2
MATH 7344	Regression, ANOVA, and Design
MATH 7345	Nonparametric Methods in Statistics
MATH 7346 to MATH 7392	
MATH 7976 to MATH 8986	
MATH 9948	Modern Mathematical Research
MATH 9984	Research
MATH 9986	Research
MATH 7721	Readings in Topology
MATH 7722	Readings in Algebraic Topology
MATH 7723	Readings in Geometric Topology
MATH 7725	Readings in Singularities
MATH 7730	Readings in Combinatorics

MATH 7731	Readings in Combinatorics and Algebra
MATH 7732	Readings in Combinatorial Geometry
MATH 7733	Readings in Graph Theory
MATH 7734	Readings in Algebra
MATH 7735	Readings in Algebraic Geometry
MATH 7736	Readings in Discrete Geometry
MATH 7737	Readings in Commutative Algebra
MATH 7741	Readings in Probability and Statistics
MATH 7751	Readings: Analysis
MATH 7752	Readings in Real Analysis
MATH 7753	Readings in Geometric Analysis
MATH 7754	Readings in Ordinary Differential Equations
MATH 7755	Readings in Partial Differential Equations
MATH 7771	Readings in Geometry
MATH 7772	Readings in Coding Theory

Dissertation

Complete the following (repeatable) course twice:

MATH 9990	Dissertation

Program Credit/GPA Requirements

32–64 total semester hours required
Minimum 3.000 GPA required

Applied Mathematics, MS

Eight graduate courses (32 semester hours of credit) are required for the degree: three required courses and five elective courses. The required courses provide a basic training in mathematical methods, and the elective courses include a wide variety of advanced topics. In addition, the program allows up to two of the elective courses to be taken outside the Department of Mathematics. No course can be used to satisfy both a requirement and an elective.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Methods and Modeling		
MATH 5131	Introduction to Mathematical Methods and Modeling	4
Algebra and Analysis		
Complete one of the following:		4
MATH 5101	Analysis 1: Functions of One Variable	
MATH 5111	Algebra 1	
MATH 7241	Probability 1	
Statistics		
MATH 7342	Mathematical Statistics	4
or MATH 7343	Applied Statistics	

Approved Mathematics Electives

Math Electives		
Complete 12 semester hours from the following subject area:		12
MATH		
Open Electives		
Complete 8 semester hours. These courses may be chosen from outside the Department of Mathematics with faculty approval.		8

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Mathematics, MS

A total of 32 semester hours, this program offers students with a bachelor's degree in mathematics or a related field an opportunity to broaden their knowledge in the several fields of mathematics and its applications. The program is designed to prepare graduates for careers in business, industry, or government. Previous course work will be evaluated to determine proficiency in certain content areas and degree plan may be tailored accordingly. In some cases, a student may be required to take an assessment exam to determine content and knowledge proficiency. No course can be used to satisfy both a requirement and an elective. To qualify for degree conferral, students must obtain a minimum cumulative average of 3.000, equivalent to a grade of B.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Algebra 1 and Analysis 1		
MATH 5101	Analysis 1: Functions of One Variable	4
or MATH 5102	Analysis 2: Functions of Several Variables	
MATH 5111	Algebra 1	4
or MATH 5112	Algebra 2	
Algebra 2 and Analysis 2		
MATH 5102	Analysis 2: Functions of Several Variables	4
or MATH 7232	Combinatorial Analysis	
Complete 4 semester hours from the following:		4
MATH 5112	Algebra 2	
Elective chosen from the list below		

Electives

Complete 16 semester hours from the following:		16
MATH 7201	Ordinary Differential Equations	
MATH 7202	Partial Differential Equations 1	
MATH 7203	Numerical Analysis 1	
MATH 7204	Complex Analysis	
MATH 7205	Numerical Analysis 2	
MATH 7221	Topology 2	
MATH 7232	Combinatorial Analysis	
MATH 7233	Graph Theory	
MATH 7234	Optimization and Complexity	
MATH 7235	Discrete Geometry 1	
MATH 7241	Probability 1	
MATH 7301	Functional Analysis	
MATH 7302	Partial Differential Equations 2	
MATH 7314	Algebraic Geometry 1	

MATH 7341	Probability 2
MATH 7342	Mathematical Statistics
MATH 7343	Applied Statistics
MATH 7344	Regression, ANOVA, and Design
MATH 7349	Stochastic Calculus and Introduction to No-Arbitrage Finance

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Operations Research, MSOR

This program seeks to train students in the basic techniques and theory of operations research and their applications to real-world problems. Graduates should have developed their analytical skills to attack complex, large-scale optimization problems of both a deterministic and stochastic nature. Eight 4-semester-hour graduate courses are required for this degree. Previous course work will be evaluated to determine proficiency in certain content areas and degree plan may be tailored accordingly. In some cases, a student may be required to take an assessment exam to determine content and knowledge proficiency. No course can be used to satisfy both a requirement and an elective. To qualify for degree conferral, a minimum cumulative grade-point average of 3.000, equivalent to a grade of B, must be obtained. Some courses listed for this program are offered in the College of Engineering or the College of Computer and Information Systems.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Probability		
Complete 4 semester hours from the following:		4
MATH 7241	Probability 1	
MATH 7341	Probability 2	
OR 7230	Probabilistic Operation Research	
Statistics		
MATH 7342	Mathematical Statistics	4
or MATH 7343	Applied Statistics	
Operations Research		
OR 6205	Deterministic Operations Research	4
Optimization and Complexity		
MATH 7234	Optimization and Complexity	4

Approved Electives

Complete 16 semester hours from the following:		16
CS 5800	Algorithms	
CS 6140	Machine Learning	
CS 7805	Theory of Computation	
CSYE 6200	Concepts of Object-Oriented Design	
CSYE 6205	Concepts of Object-Oriented Design with C++	
CSYE 6210	Component Software Development	
EECE 7313	Pattern Recognition	
EECE 7360	Combinatorial Optimization	
EMGT 5220	Engineering Project Management	
EMGT 6225	Economic Decision Making	
EMGT 6305	Financial Management for Engineers	
GE 5010	Customer-Driven Technical Innovation for Engineers	
GE 5100	Product Development for Engineers	
IE 5400	Healthcare Systems Modeling and Analysis	
IE 5500	Systems Engineering in Public Programs	
IE 5617	Lean Concepts and Applications	
IE 5620	Mass Customization	
IE 5630	Biosensor and Human Behavior Measurement	
IE 6300	Manufacturing Methods and Processes	
IE 7200	Supply Chain Engineering	
IE 7215	Simulation Analysis	
IE 7275	Data Mining in Engineering	
IE 7280	Statistical Methods in Engineering	
IE 7285	Statistical Quality Control	
IE 7290	Reliability Analysis and Risk Assessment	
IE 7315	Human Factors Engineering	
IE 7615	Neural Networks in Engineering	
MATH 7232	Combinatorial Analysis	
MATH 7233	Graph Theory	
MATH 7346	Time Series	
MATH 7347	Statistical Decision Theory	
MATH 7349	Stochastic Calculus and Introduction to No-Arbitrage Finance	
OR 7235	Inventory Theory	
OR 7240	Integer and Nonlinear Optimization	
OR 7250	Multi-Criteria Decision Making	
OR 7260	Constraint Programming	
OR 7310	Logistics, Warehousing, and Scheduling	

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Physics

Website (http://www.northeastern.edu/physics)

Paul M. Champion, PhD
Professor and Chair

110 Dana Research Center
617.373.2902
617.373.2943 (fax)
gradphysics@northeastern.edu

Mark Williams, PhD
Professor and Director of Graduate Studies, ma.williams@northeastern.edu

Nancy Wong
Program Coordinator
n.wong@northeastern.edu

617.373.4240

The Northeastern Department of Physics performs advanced research in condensed matter, fundamental particles and fields, biophysics, and complexity. Students are expected to have demonstrated a graduate-level understanding of basic physics concepts upon completion of the MS degree. The program for the PhD degree consists of the required course work, a qualifying examination, a preliminary research seminar, the completion of a dissertation based upon original research performed by the student, and a dissertation defense upon completion of the dissertation. Based on these measures, students are expected to obtain a graduate-level understanding of basic physics concepts and demonstrate the ability to formulate a research plan, communicate orally a research plan, and conduct and present independent research.

Programs

Doctor of Philosophy (PhD)

- Physics (p. 360)
- Physics—Advanced Entry (p. 362)

Master of Science (MS)

- Physics (p. 365)

Graduate Certificate

- Nanomedicine (p. 366)

Physics, PhD

The Department of Physics offers a Doctor of Philosophy in Physics with specializations in different subfields that reflect the forefront research activities of the department, including biological physics, condensed matter physics, elementary particle physics, nanomedicine, and network science. The program for the PhD degree consists of the required course work, a qualifying examination, a preliminary research seminar, the completion of a dissertation based upon original research performed by the student, and a dissertation defense upon completion of the dissertation. Based on these measures, students are expected to obtain a graduate-level understanding of basic physics concepts and demonstrate the ability to formulate a research plan, communicate orally a research plan, and conduct and present independent research.

Course Work

The required courses are grouped into two sets, Part 1 and Part 2, having a total of 42 semester hours as a minimum. Part 1 courses (first-year courses) are typically taken prior to the qualifying exam. Students without a master's degree must complete all Part 1 courses in the first year to remain in good academic standing in the graduate program. Part 2 courses (second-year courses) may be taken before or after passing the qualifying exam.

Grade Requirements

The minimum grade required for the successful completion of the Part 1 courses is a B (3.000) average. Students will only be allowed to take the qualifying exam if they fulfill this requirement. The minimum grade required for the successful completion of Part 2 (excluding advanced research) is at least a B (3.000) average for the Part 2 courses. The Part 2 courses, including any makeup of grade-point-average deficiencies (see following), must be completed within two calendar years of passing the qualifying exam. The department expects students to complete the bulk of these courses in the first year after the qualifying exam. The cumulative average will be calculated each semester. No more than two courses or 8 semester hours of credit, whichever is greater, may be repeated in order to satisfy the requirement for the PhD degree. A student who does not maintain a 3.000 cumulative average for two consecutive semesters, or is otherwise not making satisfactory progress toward the PhD degree requirements, may be recommended for termination at the discretion of the graduate committee. Within the above limitations, a required course for which a grade of F is received must be repeated with a grade of C or better and may be repeated only once. In calculating the overall cumulative average, all graduate-level course work completed at the time of clearance for graduation will be counted.

Qualifying Exam Requirement

A student who fails to achieve the required B average for the Part 1 courses must petition the graduate committee in order to remain in the graduate program and be eligible to take the qualifying exam. A student who fails to achieve the required B average for the Part 2 courses must petition the graduate committee in order to remain in the graduate program. All students registered in the PhD program are required to pass a qualifying exam unless they are granted an exemption (see below). The qualifying exam may include both written and oral parts.

The qualifying exam consists of two parts:

- **Part 1:** Classical physics (based on classical mechanics and mathematical methods), electromagnetic theory, and statistical physics.
- **Part 2:** Quantum physics (based on quantum mechanics and its applications) and statistical physics. The content of the qualifying exam will be based on the content of the first-year courses, excluding Principles of Experimental Physics (PHYS 5318). A syllabus is available and on request will be distributed by the graduate coordinator to any student prior to the exam.

The qualifying exam is given twice yearly: once prior to the start of the fall semester and again within the first two weeks of the start of the spring semester. The exam will consist of one day each on Part 1 (classical physics/mathematical methods, electromagnetism, and statistical physics) and Part 2 (quantum physics and statistical physics).

All students enrolled in the PhD program must take the fall qualifying exam after completing their first-year course of study with the required grade-point average unless they are granted an exemption. Students taking the exam for the first time must take both Part 1 and Part 2. A student who does not pass the exam on his or her first attempt must pass the exam the next time it is given in order to continue in the PhD program. However, a student who passes one part of the first attempt is not required to repeat that part.

Any PhD student will be exempt from taking the quantum part of the qualifying exam if they receive both a grade of B+ or higher inQuantum Theory 1 (PHYS 7315), Quantum Theory 2 (PHYS 7316), and Statistical Physics (PHYS 7305) and have a GPA of 3.670 or higher in those three courses. To meet this standard, they must take all the above courses. Any PhD student will be exempt from taking the classical part of the qualifying exam if they receive both a grade of B+ or higher in Classical Mechanics/Math Methods (PHYS 7301), Electromagnetic Theory (PHYS 7302), and Statistical Physics (PHYS 7305) and have a GPA of 3.670 or higher in these three courses. To meet this standard, they must take all three of these courses.

A student who fails the written exam by less than 5 percent of the total possible score on the second attempt for that part will be automatically given an oral exam. A student who fails the written exam by more than 10 percent is excluded from taking an oral exam. These provisions apply separately to Parts 1 and 2 of the exam.

PhD Candidacy

Degree candidacy is established when the student has passed the qualifying examination and completed both the Part 1 and Part 2 course requirements. PhD candidacy may be achieved before completion of the advanced elective if the elective in the student's specialization is not offered in a given year. The elective must be taken at the next opportunity. PhD degree candidacy is certified by the college. A maximum of five years after the establishment of doctoral degree candidacy is allowed for the completion of degree requirements.

PhD Dissertation Requirement

All PhD students are required to complete a dissertation based upon new and original research in one of the three following options:

- In one of the current theoretical or experimental research programs in the department, under direct supervision of an advisor from the Department of Physics. A dissertation committee will be formed consisting of the advisor, two full-time members of the department, and an additional member, either from within the department or from an outside department or institution.
- In a recognized interdisciplinary field involving another research area of the university, under the direct supervision of a faculty member in that field. In this case, an interdisciplinary committee is formed under the approval of the graduate committee, consisting of the direct supervisor, a departmental advisor, one other member of the department, and an additional member of either the department or the external department.
- In an area of applied research in one of the industrial or high-technology laboratories associated with the department's industrial PhD program. The direct supervisor is associated with the institution where the research is performed. In this case, a dissertation advisory committee is established by the graduate committee, consisting of the direct supervisor, the departmental advisor, and two other members of the department.

PhD students must select their departmental advisor no later than the end of the spring semester of their second year or their second semester after having passed the qualifying examination, whichever comes first. This process should start as soon as the student has identified a field of research or has passed the qualifying exam.

PhD Dissertation Committee, Preliminary Thesis Proposal, and Preliminary Research Seminar

By the end of the spring semester of the third year or the second semester in which the student is enrolled for PhD dissertation, whichever comes first, each PhD student must have an approved dissertation committee and thesis proposal.

The student (with the aid and approval of his or her thesis advisor) will submit a PhD thesis proposal to the graduate committee clearly outlining a plan to carry out new and original research in the context of previously published research in the scientific literature and also describe the methodologies to be employed. The thesis proposal is limited to 15 pages or less, including references. A proposed makeup of the dissertation committee will be submitted at the same time.

The graduate committee will evaluate the merit of the proposal and make recommendations for improvements when necessary, including any changes to the composition of the dissertation committee. No more than two submissions for a particular proposal may be made. In the case where a revised proposal does not meet a minimum academic standard that provides a basis for making such improvements, the graduate committee may instruct the student to select a different thesis topic or advisor.

After approval by the graduate committee, the proposal is circulated to the general faculty for comments. If the graduate coordinator receives any objections, the proposal will be referred back to the graduate committee for final resolution.

After the proposal and dissertation committee have been approved, the student will make a public presentation of the material in the preliminary research seminar before the dissertation committee in a format open to the full department and advertised one week in advance. The dissertation committee will then meet in closed session to evaluate the seminar. The preliminary research seminar must take place no later than the semester after the thesis proposal is approved and, normally, in the same semester.

In the event that the dissertation advisor is changed, a new committee must be formed, with the approval of the graduate committee, and a new preliminary research seminar given.

PhD Dissertation Defense

The dissertation defense consists of a public presentation, followed by a question period conducted by the dissertation committee and limited to them and the department faculty. The date of the dissertation presentation must be publicized and a copy of the thesis deposited with the graduate program coordinator at least one week prior to the defense. If during this posting period or in the two business days following the defense a written objection to the thesis is lodged with the department chair by a member of the faculty, the chair may appoint an ad hoc postdefense review committee to provide advice on the scientific issues raised by the objection. Students should note that they must be registered for Dissertation or Dissertation Continuation during the semester in which they defend their dissertation and that they should schedule their defenses well in advance of the end of the semester in order to accommodate the review/waiting period and the time required to deposit the thesis.

The final dissertation defense is held in accordance with the College of Science regulations.

PhD Specialization Options

Students choose a specialization in biological physics; particle physics; condensed matter physics; or, with preapproval of a faculty member, in the following areas: nanomedicine or network science.

Multiple specializations are allowed if the individual requirements for each specialization are met.

Note that the specialization will not appear on the degree diploma or on the official transcript but can be listed as the field of study on CVs and grant proposals.

Transfer Credit

Students must petition in writing through the graduate committee to the director of graduate student services for all transfer credit. A copy of an official transcript must be attached to the Request for Transfer Credit form. A maximum of 8 semester hours of credit obtained at another institution may be accepted toward the PhD degree provided that the credits transferred consist of a grade of B or better, are graduate-level courses, have been earned at an accredited U.S. institution, and have not been used toward any other degree. Grades are not transferred.

Course Waivers

Course waivers may be accepted toward the PhD degree course requirements, though they will not change the numbers of credits required for the program. The student must have received a B grade or better in equivalent graduate-level core courses that have been earned at an accredited institution. Students must petition in writing to the graduate committee for all course waivers and provide documentation in the form of official transcripts to support their petition.

Residence Requirement

The residence requirement is satisfied by at least one year of full-time graduate work (i.e., enrollment in PhD Dissertation, for two consecutive semesters). Students must be continually enrolled throughout the pursuit of the dissertation.

Internship Option

A PhD candidate may spend one year in a participating high-technology, industrial, or government laboratory immediately after passing the PhD qualifying examination. In this program, the student is expected to remain in touch with the university by taking one course per semester at the university and by frequent contact with a faculty advisor. After the one-year paid internship, the student returns to the university to do the dissertation. Eligibility for this program is contingent on acceptance both by the department and by the external laboratory.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Two qualifying examinations
Annual review
Candidacy
Preliminary research seminar proposal with proposed dissertation committee
Preliminary research seminar talk
Dissertation defense

Year 1

Fall Term		
PHYS 7210	Introduction to Research in Physics	0
PHYS 7301	Classical Mechanics/Math Methods	4
PHYS 7302	Electromagnetic Theory	4
PHYS 7315	Quantum Theory 1	4
Spring Term		
PHYS 5318	Principles of Experimental Physics	4
PHYS 7210	Introduction to Research in Physics	0
PHYS 7305	Statistical Physics	4
PHYS 7316	Quantum Theory 2	4

Year 2

Fall Term		
PHYS 7321	Computational Physics	4
Electives		
If preapproved to specialize in nanomedicine or network science, consult program director.		
Complete 8 semester hours from the following:		8
PHYS 7731	Biological Physics 1	
PHYS 7323	Elementary Particle Physics	
PHYS 7324	Condensed Matter Physics	
Spring Term		
PHYS 9984	Advanced Research	1-8
Advanced Elective		
Choose 4 semester hours from your specialization below:		4

PhD Specialization Options

A specialization is required.[1]
Note: Specialization in nanomedicine or network science requires prior approval.

Biological Physics [2]		
PHYS 7731	Biological Physics 1	4
PHYS 7741	Biological Physics 2	4
Particle Physics		
PHYS 7323	Elementary Particle Physics	4
PHYS 7733	Topics: Elementary Particle Physics and Cosmology	4
Condensed Matter Physics		
PHYS 7324	Condensed Matter Physics	4
PHYS 7734	Topics: Condensed Matter Physics	4
Nanomedicine		
NNMD 5270	Introduction to Nanomedicine Science and Technology	3
NNMD 5370	Nanomedicine Research Techniques	4
Network Science		
PHYS 5116	Complex Networks and Applications	4
PHYS 7331	Network Science Data	4

Dissertation Courses (Third Year and Beyond)

Complete the following (repeatable) course twice:		
PHYS 9990	Dissertation	
Complete the following (repeatable) course until graduation:		
PHYS 9996	Dissertation Continuation	

Program Credit/GPA Requirements

42 total semester hours required
Minimum 3.000 GPA required

[1] Note that the specialization will not appear on the degree diploma or on the official transcript but can be listed as the field of study on CVs and grant proposals.

[2] By approval of the graduate committee, biological physics students may substitute graduate courses in biology, physics, or chemistry from the following list instead of PHYS 7741:
Biochemistry (BIOL 6300), Molecular Cell Biology (BIOL 6301), Structural Biology (BIOL 7303), Optical Methods of Analysis (CHEM 5613), Molecular Modeling (CHEM 5638), Chemical Kinetics (CHEM 5639) or Principles of Magnetic Resonance (CHEM 5688).
Additional appropriate courses may also be substituted by approval of the physics graduate committee.

Physics, PhD—Advanced Entry

The Department of Physics offers a Doctor of Philosophy in Physics with specializations in different subfields that reflect the forefront research activities of the department, including biological physics, condensed matter physics, elementary particle physics, nanomedicine,

and network science. The program for the PhD degree consists of the required course work, a qualifying examination, a preliminary research seminar, the completion of a dissertation based upon original research performed by the student, and a dissertation defense upon completion of the dissertation. Based on these measures, students are expected to obtain a graduate-level understanding of basic physics concepts and demonstrate the ability to formulate a research plan, communicate orally a research plan, and conduct and present independent research.

Course Work

The required courses are grouped into two sets, Part 1 and Part 2, having a total of 42 semester hours as a minimum. Part 1 courses (first-year courses) are typically taken prior to the qualifying exam. Any new, entering student with a master's degree from a U.S. institution may take the qualifying exam upon arriving at Northeastern University. Failure of the exam at this time will not be used to limit the two opportunities to take the examination in the future.Students who successfully pass both Part 1 and Part 2 of the qualifying exam on entry are exempted from the first-year course work except for Principles of Experimental Physics (PHYS 5318), which all students are required to take.

Grade Requirements

The minimum grade required for the successful completion of the Part 1 courses is a B (3.000) average. Students will only be allowed to take the qualifying exam if they fulfill this requirement. The minimum grade required for the successful completion of Part 2 (excluding advanced research), is at least a B (3.000) average for the Part 2 courses. The Part 2 courses, including any makeup of grade-point-average deficiencies (see following), must be completed within two calendar years of passing the qualifying exam. The department expects students to complete the bulk of these courses in the first year after the qualifying exam. The cumulative average will be calculated each semester. No more than two courses or 8 semester hours of credit, whichever is greater, may be repeated in order to satisfy the requirement for the PhD degree. A student who does not maintain a 3.000 cumulative average for two consecutive semesters, or is otherwise not making satisfactory progress toward the PhD degree requirements, may be recommended for termination at the discretion of the graduate committee. Within the above limitations, a required course for which a grade of F is received must be repeated with a grade of C or better and may be repeated only once. In calculating the overall cumulative average, all graduate-level course work completed at the time of clearance for graduation will be counted.

Qualifying Exam Requirement

A student who fails to achieve the required B average for the Part 1 courses must petition the graduate committee in order to remain in the graduate program and be eligible to take the qualifying exam. A student who fails to achieve the required B average for the Part 2 courses must petition the graduate committee in order to remain in the graduate program. All students registered in the PhD program are required to pass a qualifying exam. The qualifying exam may include both written and oral parts. Any new, entering student with a master's degree from a U.S. institution may take the qualifying exam upon arriving at Northeastern University. Failure of the exam at this time will not be used to limit the two opportunities to take the examination in the future.

The qualifying exam consists of two parts:

- **Part 1:** Classical physics (based on classical mechanics and mathematical methods), electromagnetic theory, and statistical physics.
- **Part 2:** Quantum physics (based on quantum mechanics and its applications) and statistical physics. The content of the qualifying exam will be based on the content of the first-year courses, excluding Principles of Experimental Physics (PHYS 5318) . A syllabus is available and on request will be distributed by the graduate coordinator to any student prior to the exam.

The qualifying exam is given twice yearly: once prior to the start of the fall semester and again within the first two weeks of the start of the spring semester. The exam will consist of one day each on Part 1 (classical physics/mathematical methods, electromagnetism, and statistical physics) and Part 2 (quantum physics and statistical physics).

Students who enter with a Master of Science degree from a U.S. institution may take the exam at the first opportunity after entering the program. Students who successfully pass both Part 1 and Part 2 of the qualifying exam on entry are exempted from the first-year courses except for Principles of Experimental Physics (PHYS 5318) , which all students must take.

All students enrolled in the PhD program must take the fall qualifying exam after completing their first-year course of study with the required grade-point average. Students taking the exam for the first time must take both Part 1 and Part 2. A student who does not pass the exam on his or her first attempt must pass the exam the next time it is given in order to continue in the PhD program. However, a student who passes one part of the first attempt is not required to repeat that part.

A student who fails the written exam by less than 5 percent of the total possible score on the second attempt for that part will be automatically given an oral exam. A student who fails the written exam by more than 10 percent is excluded from taking an oral exam. These provisions apply separately to Parts 1 and 2 of the exam.

PhD Candidacy

Degree candidacy is established when the student has passed the qualifying examination and completed both the Part 1 and Part 2 course requirements. PhD candidacy may be achieved before completion of the advanced elective if the elective in the student's specialization is not offered in a given year. The elective must be taken at the next opportunity. PhD degree candidacy is certified by the college. A maximum of five years after the establishment of doctoral degree candidacy is allowed for the completion of degree requirements.

PhD Dissertation Requirement

All PhD students are required to complete a dissertation based upon new and original research in one of the three following options:

- In one of the current theoretical or experimental research programs in the department, under direct supervision of an advisor from the Department of Physics. A dissertation committee will be formed consisting of the advisor, two full-time members of the department, and an additional member, either from within the department or from an outside department or institution.
- In a recognized interdisciplinary field involving another research area of the university, under the direct supervision of a faculty member in that field. In this case, an interdisciplinary committee is formed under the approval of the graduate committee, consisting of the direct supervisor, a departmental advisor, one other member of the department, and an additional member of either the department or the external department.
- In an area of applied research in one of the industrial or high-technology laboratories associated with the department's industrial PhD program. The direct supervisor is associated with the institution where the research is performed. In this case, a dissertation advisory committee is established by the graduate committee, consisting

of the direct supervisor, the departmental advisor, and two other members of the department.

PhD students must select their departmental advisor no later than the end of the spring semester of their second year or their second semester after having passed the qualifying examination, whichever comes first. This process should start as soon as the student has identified a field of research or has passed the qualifying exam.

PhD Dissertation Committee, Preliminary Thesis Proposal, and Preliminary Research Seminar

By the end of the spring semester of the third year or the second semester in which the student is enrolled for PhD dissertation, whichever comes first, each PhD student must have an approved dissertation committee and thesis proposal.

The student (with the aid and approval of his or her thesis advisor) will submit a PhD thesis proposal to the graduate committee clearly outlining a plan to carry out new and original research in the context of previously published research in the scientific literature and also describe the methodologies to be employed. The thesis proposal is limited to 15 pages or less, including references. A proposed makeup of the dissertation committee will be submitted at the same time.

The graduate committee will evaluate the merit of the proposal and make recommendations for improvements when necessary, including any changes to the composition of the dissertation committee. No more than two submissions for a particular proposal may be made. In the case where a revised proposal does not meet a minimum academic standard that provides a basis for making such improvements, the graduate committee may instruct the student to select a different thesis topic or advisor.

After approval by the graduate committee, the proposal is circulated to the general faculty for comments. If the graduate coordinator receives any objections, the proposal will be referred back to the graduate committee for final resolution.

After the proposal and dissertation committee have been approved, the student will make a public presentation of the material in the preliminary research seminar before the dissertation committee in a format open to the full department and advertised one week in advance. The dissertation committee will then meet in closed session to evaluate the seminar. The preliminary research seminar must take place no later than the semester after the thesis proposal is approved and, normally, in the same semester.

In the event that the dissertation advisor is changed, a new committee must be formed, with the approval of the graduate committee, and a new preliminary research seminar given.

PhD Dissertation Defense

The dissertation defense consists of a public presentation, followed by a question period conducted by the dissertation committee and limited to them and the department faculty. The date of the dissertation presentation must be publicized and a copy of the thesis deposited with the graduate program coordinator at least one week prior to the defense. If during this posting period or in the two business days following the defense a written objection to the thesis is lodged with the department chair by a member of the faculty, the chair may appoint an ad hoc postdefense review committee to provide advice on the scientific issues raised by the objection. Students should note that they must be registered for Dissertation or Dissertation Continuation during the semester in which they defend their dissertation and that they should schedule their defenses well in advance of the end of the semester in order to accommodate the review/waiting period and the time required to deposit the thesis.

The final dissertation defense is held in accordance with the College of Science regulations.

Transfer Credit

Students must petition in writing through the graduate committee to the director of graduate student services for all transfer credit. A copy of an official transcript must be attached to the Request for Transfer Credit form. A maximum of 8 semester hours of credit obtained at another institution may be accepted toward the PhD degree provided that the credits transferred consist of a grade of B or better, are graduate-level courses, have been earned at an accredited U.S. institution, and have not been used toward any other degree. Grades are not transferred.

Course Waivers

Course waivers may be accepted toward the PhD degree course requirements, though they will not change the numbers of credits required for the program. The student must have received a B grade or better in equivalent graduate-level core courses that have been earned at an accredited institution. Students must petition in writing to the graduate committee for all course waivers and provide documentation in the form of official transcripts to support their petition.

Residence Requirement

The residence requirement is satisfied by at least one year of full-time graduate work (i.e., enrollment in PhD Dissertation, for two consecutive semesters). Students must be continually enrolled throughout the pursuit of the dissertation.

Internship Option

A PhD candidate may spend one year in a participating high-technology, industrial, or government laboratory immediately after passing the PhD qualifying examination. In this program, the student is expected to remain in touch with the university by taking one course per semester at the university and by frequent contact with a faculty advisor. After the one-year paid internship, the student returns to the university to do the dissertation. Eligibility for this program is contingent on acceptance both by the department and by the external laboratory.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Two qualifying examinations
Annual review
Candidacy
Preliminary research seminar proposal with proposed dissertation committee
Preliminary research seminar talk
Dissertation defense

**Note:* Any new, entering student with a master's degree from a U.S. institution may take the qualifying exam upon arriving at Northeastern University. Failure of the exam at this time will not be used to limit the two opportunities to take the examination in the future

Requirements

Course Work

Students entering with an approved MS degree from a U.S. institution will be required to take 10 semester hours of courses. The courses required will be determined by the graduate coordinator based on the student's transcripts.		10
Complete the following:		
PHYS 5318	Principles of Experimental Physics	4
Dissertation		
Complete the following (repeatable) course twice:		
PHYS 9990	Dissertation	
Complete the following (repeatable) course until graduation:		
PHYS 9996	Dissertation Continuation	

Program Credit/GPA Requirements

10 total semester hours required
Minimum 3.000 GPA required

Physics, MS

The Department of Physics offers Master of Science degrees with several options. The standard physics MS can be obtained by taking a specified set of courses without an MS thesis. Alternatively, an MS thesis may substitute for 8 credit hours of course work. Both of these options may be pursued either full time or part time. Upon completion of the MS degree in physics, students should be able to apply graduate-level knowledge and solve problems in the areas of electrodynamics, quantum mechanics, classical mechanics, statistical mechanics, and advanced mathematical methods.

Grade Requirements

To qualify for the MS degree, a cumulative average of 3.000, equivalent to a grade of B, must be obtained. No more than two courses or 6 semester hours of credit, whichever is greater, may be repeated in order to satisfy the requirements for the MS degree. A student who does not maintain a 3.000 cumulative average for two consecutive semesters, or is otherwise not making satisfactory progress toward the MS degree requirements, may be recommended for termination at the discretion of the graduate committee.

Within the above limitations, a required course for which a grade of F is received must be repeated with a grade of C or better and may be repeated only once. Elective courses in which an F has been received may be repeated once to obtain a C or better.

Transfer Credit

Students must petition, in writing, through the graduate committee to the director of graduate student services for all transfer credit. An official transcript must be attached to the Request for Transfer Credit form. A maximum of 8 semester hours of credit obtained at another institution may be accepted toward the MS degree provided that the credits transferred consist of a grade of B or better in graduate-level courses, have been earned at an accredited U.S. institution, and have not been used toward any other degree. Grades are not transferred.

Current MS Students Interested in the PhD Program

MS students interested in applying to the PhD program must complete the internal admission application.

Special Student Status

Special students are allowed to earn credit for a maximum of 12 semester hours. Students interested in taking more than 12 semester hours must make a formal application to the degree program online.

Course Work

There is a total of 32 semester hours of course work required as a minimum. There are two options for the MS degree:

Option 1 is the standard physics MS with or without an MS thesis. Up to 8 semester hours of courses can be substituted with an MS thesis.

Option 2 is the MS with a specialization (up to 23 semester hours of courses) in applied physics, engineering physics, biophysics, chemical physics, material physics, mathematical physics, and computational physics.

Graduate students desiring the MS with thesis option should arrange a thesis with a faculty advisor. The student may choose a field of research from three possible areas as outlined under the PhD dissertation section. The thesis must demonstrate the individual's capacity to execute independent work based on original material. The thesis must be approved by the graduate committee. The thesis may be completed in one semester (e.g., summer semester) or in consecutive semesters. Students who have not completed their thesis after the required number of thesis credits (12 semester hours) must register for MS Thesis with the appropriate course number each subsequent semester until the thesis is approved by the graduate school and submitted electronically to Proquest.

Both options require a minimum of 32 semester hours of graduate credit. The 32 semester hours may include up to 8 semester hours of transfer credit as approved by the physics department's graduate committee and the graduate school.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core

Fall Term 1		
PHYS 7301	Classical Mechanics/Math Methods	4
PHYS 7302	Electromagnetic Theory	4
PHYS 7315	Quantum Theory 1	4
May be taken either first or second year:		
PHYS 7321	Computational Physics	4
Spring Term 1		
PHYS 7305	Statistical Physics	4
PHYS 7316	Quantum Theory 2	4

Options

- Course work
- Thesis
- Thesis with specialization[1]

COURSE WORK OPTION

Note: In consultation with your faculty advisor you may choose an area of specialization from physics, engineering, chemistry, biology, mathematics, psychology, or computer science. Additional elective courses are listed in the PhD program.

Electives		
Complete 8 semester hours from the following:		
PHYS 5111	Astrophysics and Cosmology	

PHYS 5113	Introduction to Particle and Nuclear Physics
PHYS 5114	Physics of Advanced Materials
PHYS 5115	Quantum Mechanics
PHYS 5116	Complex Networks and Applications
PHYS 5260	Introduction to Nanoscience and Nanotechnology
PHYS 5318	Principles of Experimental Physics
PHYS 7323	Elementary Particle Physics
PHYS 7324	Condensed Matter Physics
PHYS 7731	Biological Physics 1

THESIS

Thesis		
PHYS 7990	Thesis	1-4
Elective		
Complete 4 semester hours from the following:		4
PHYS 5111	Astrophysics and Cosmology	
PHYS 5113	Introduction to Particle and Nuclear Physics	
PHYS 5114	Physics of Advanced Materials	
PHYS 5115	Quantum Mechanics	

THESIS WITH SPECIALIZATION [1]

Applied physics, engineering physics, biophysics, chemical physics, materials physics, mathematical physics, or computational physics.

Thesis		
PHYS 7990	Thesis	1-4
Core/Electives		
Complete course work in consultation with faculty advisor.		28

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

[1] Note that the specialization will not appear on the degree diploma or on the official transcript but can be listed as the field of study on CVs and grant proposals.

Nanomedicine, Graduate Certificate

The Graduate Certificate in Nanomedicine is designed for scientists, engineers, and physicians to develop competency and practical skills in the application of nanotechnology to problems in medicine. This program is appropriate for those working in or seeking careers in biotechnology, pharmaceutical, biomedical, or clinical fields. Program participants receive advanced training in the fundamental and applied aspects of nanomedicine, as well as nanomedicine commercialization from bench to bedside. The curriculum includes a variety of activities for scientific and professional development, including lectures, case studies, journal readings, term projects, and close interactions with distinguished faculty and experts drawn from academia, hospitals, industry, and government.

The certificate consists of five nanomedicine (NNMD) courses, totaling 12 semester-hour credits. This is a part-time, 12-credit graduate program that can be completed in as little as two semesters.

Program Requirements

Complete all requirements listed below unless otherwise indicated.

Requirements

Core Courses		
NNMD 5270	Introduction to Nanomedicine Science and Technology	3
NNMD 5272	Nanomedicine General Seminar	1
NNMD 5274	Nanomedicine Advanced Seminar	1
NNMD 5370	Nanomedicine Research Techniques	4
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market	3
Electives		
Students may apply 4 semester hours of elective credit to substitute for NNMD 5370.		
BIOL 5307	Biological Electron Microscopy	
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations	
CHEM 7247	Advances in Nanomaterials	
CHME 7350	Transport Phenomena	
ENGR 6150	Nanotechnology in Engineering	
PHSC 6210	Drug Design, Evaluation, and Development	
PHSC 6216	Human Physiology and Pathophysiology	
PHSC 6226	Imaging in Medicine and Drug Discovery	
PHSC 6290	Biophysical Methods in Drug Discovery	
PHYS 5260	Introduction to Nanoscience and Nanotechnology	
PHYS 7731	Biological Physics 1	
PMST 6252	Pharmacokinetics and Drug Metabolism	
PMST 6254	Advanced Drug Delivery System	
POLS 7333	Science, Technology, and Public Policy	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Psychology

Website (http://www.northeastern.edu/psychology)

Joanne L. Miller, PhD
Matthews Distinguished University Professor and Chair

125 Nightingale Hall
617.373.3076
617.373.8714 (fax)

Judith Hall, PhD
University Distinguished Professor and Director of Graduate Studies, j.hall@northeastern.edu (e.cram@northeastern.edu)

Fotini Christophillis, Staff Assistant, f.christophillis@northeastern.edu

The PhD program in the Department of Psychology covers a wide spectrum of contemporary behavioral science within a close-knit

community of faculty and students. The program offers four distinct areas of experimental emphasis: behavioral neuroscience, cognition, perception, and social/personality. The program does not offer training in clinical or counseling psychology. The objective of the PhD program is to prepare students to become experts in research and teaching in psychology. To accomplish this goal, the department takes a mentoring approach whereby the graduate students are apprentices in faculty laboratories, working closely with their faculty mentors throughout their time in the program. The basic apprenticeship relationship is supplemented by other activities, such as required courses (concentrated in the first and second years), advanced seminars and/or course work in this as well as other departments or universities, a colloquium series, assignments as teaching assistants, the master's project, and the dissertation and its oral defense. After the first year, the structure of the doctoral program, including course work, is flexible and assumes that the process of learning and scientific discovery must be individualized. Graduate students also have an opportunity to develop their teaching and research skills through close mentoring of undergraduate research assistants. The PhD program is a five-year, twelve-months-per-year program. Students earn their master's degree at the end of their second year and progress to PhD candidacy. There is no freestanding master's program.

For students who enter the program with a master's degree, degree candidacy is established through completion of a set of requirements determined on an individual basis. An additional 20 semester hours beyond the master's degree are required for the PhD degree. The dissertation committee must include at least three tenured or tenure-track faculty members from within the psychology department—two from the student's interest area and one from another area. The oral defense committee consists of the dissertation committee plus additional tenured and tenure-track faculty members from the psychology department.

Programs

Doctor of Philosophy (PhD)

- Psychology (p. 367)
- Psychology—Advanced Entry (p. 368)

Psychology, PhD

The PhD program in the Department of Psychology covers a wide spectrum of contemporary behavioral science within a close-knit community of faculty and students. The program offers four distinct areas of experimental emphasis: behavioral neuroscience, cognition, perception, and social/personality. The program does not offer training in clinical or counseling psychology. The objective of the PhD program is to prepare students to become experts in research and teaching in psychology. To accomplish this goal, the department takes a mentoring approach whereby the graduate students are apprentices in faculty laboratories, working closely with their faculty mentors throughout their time in the program. The basic apprenticeship relationship is supplemented by other activities, such as required courses (concentrated in the first and second years), advanced seminars and/or course work in this as well as other departments or universities, a colloquium series, assignments as teaching assistants, the master's project, and the dissertation and its oral defense. After the first year, the structure of the doctoral program, including course work, is flexible and assumes that the process of learning and scientific discovery must be individualized. Graduate students also have an opportunity to develop their teaching and research skills through close mentoring of undergraduate research assistants. The PhD program is a five-year, twelve-months-per-year program.

The dissertation committee must include at least three tenured or tenure-track faculty members from within the psychology department—two from the student's interest area and one from another area. The oral defense committee consists of the dissertation committee plus additional tenured and tenure-track faculty members from the psychology department.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

First-year paper
Master's proposal
Master's paper
Master's presentation
Annual review
Dissertation committee
Dissertation proposal
Dissertation
Dissertation defense
At least two assigned courses as teaching assistant

Core Course Work

All graduate courses within the Department of Psychology are graded S/U. A grade of S is required in each psychology department course.

Year 1

Fall	Hours	Spring	Hours	Summer Full Semester	Hours
Complete 6 semester hours of the following:	6	Complete 6 semester hours of the following:	6	PSYC 8401	3
PSYC 510(		PSYC 510(			
PSYC 5110		PSYC 5110			
PSYC 512(		PSYC 512(			
PSYC 5130		PSYC 5130			
PSYC 514(		PSYC 514(			
PSYC 5150		PSYC 5150			
PSYC 516(		PSYC 516(			
PSYC 5170		PSYC 5170			
	6		6		
PSYC 5180		PSYC 5181			
PSYC 840˙		PSYC 840˙			
	12		12		3

Year 2

Fall	Hours	Spring	Hours	Summer Full Semester	Hours
PSYC 7990	3	Complete one of the following:	3	PSYC 7996	0
		PSYC 730˙			
		PSYC 7302			
		Complete the following:	3		
		PSYC 7990			
	3		6		0

Year 3

Fall	Hours	Spring	Hours	Summer Full Semester	Hours
PSYC 9990	0	Complete one of the following:	3	PSYC 9996	0
		PSYC 7301			
		PSYC 7302			
		Complete the following:	0		
		PSYC 9990			
	0		3		0

Year 4

Fall	Hours	Spring	Hours	Summer Full Semester	Hours
PSYC 9996	0	PSYC 9996	0	PSYC 9996	0
	0		0		0

Year 5

Fall	Hours	Spring	Hours	Summer Full Semester	Hours
PSYC 9996	0	PSYC 9996	0	PSYC 9996	0
	0		0		0

Total Hours: 39

Electives

Complete 11 semester hours of electives, which can include psychology electives and proseminars (see below) not taken already to fulfill core requirements, as well as outside electives if approved by faculty advisor and graduate coordinator.

PSYC 7200 to PSYC 7300	
PSYC 5100	Proseminar in Psycholinguistics
PSYC 5110	Proseminar in Cognition
PSYC 5120	Proseminar in Sensation
PSYC 5130	Proseminar in Perception
PSYC 5140	Proseminar in Biology of Behavior
PSYC 5150	Proseminar in Clinical Neuroscience
PSYC 5160	Proseminar in Personality
PSYC 5170	Proseminar in Social Psychology

Program Credit/GPA Requirements

50 total semester hours required
Minimum 3.000 GPA required

Psychology, PhD—Advanced Entry

The PhD program in the Department of Psychology covers a wide spectrum of contemporary behavioral science within a close-knit community of faculty and students. The program offers four distinct areas of experimental emphasis: behavioral neuroscience, cognition, perception, and social/personality. The program does not offer training in clinical or counseling psychology. The objective of the PhD program is to prepare students to become experts in research and teaching in psychology. To accomplish this goal, the department takes a mentoring approach whereby the graduate students are apprentices in faculty laboratories, working closely with their faculty mentors throughout their time in the program. The basic apprenticeship relationship is supplemented by other activities, such as required courses (concentrated in the first and second years), advanced seminars and/or course work in this as well as other departments or universities, a colloquium series, assignments as teaching assistants, the master's project, and the dissertation and its oral defense. After the first year, the structure of the doctoral program, including course work, is flexible and assumes that the process of learning and scientific discovery must be individualized. Graduate students also have an opportunity to develop their teaching and research skills through close mentoring of undergraduate research assistants. The PhD program is a five-year, 12-months-per-year program.

For students who enter the program with a suitable master's degree, degree candidacy is established through completion of a set of requirements determined on an individual basis. An additional 20 semester hours beyond the master's degree are required for the PhD degree. The dissertation committee must include at least three tenured or tenure-track faculty members from within the psychology department—two from the student's interest area and one from another area. The oral defense committee consists of the dissertation committee plus additional tenured and tenure-track faculty members from the psychology department.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated. Individual programs of study will be tailored to acknowledge students' previous course work.

Milestones

Master's presentation
Annual review
Dissertation committee
Dissertation proposal
Dissertation
Dissertation defense
At least two assigned courses as teaching assistant

Core Requirements

All graduate courses within the Department of Psychology are graded S/U. A grade of S is required in each psychology department course. The number of semester hours to complete this program may be more than 20. The number of semester hours and the specific required courses will be determined by a review of previous course work by the graduate coordinator and faculty advisor.

APPROVED COURSE WORK

Consult your faculty advisor and graduate coordinator for acceptable courses.

APPROVED ELECTIVES

Consult your faculty advisor and graduate coordinator for acceptable electives.

Dissertation Courses

Complete the following (repeatable) course twice:		0
PSYC 9990	Dissertation	

Program Credit/GPA Requirements

20 total semester hours required
Minimum 3.000 GPA required

Interdisciplinary

Programs

Doctor of Philosophy (PhD)

- Network Science (p. 209)

Master of Science (MS)

- Applied Physics and Engineering (p. 147)

Network Science, PhD

David Lazer, PhD
Distinguished Professor
College of Social Sciences and Humanities and College of Computer and Information Science

Network Science Program
177 Huntington Avenue, 10th Floor
617.373.8856
617.373.5884 (fax)
Website (http://www.networkscienceinstitute.org)
networkscience@northeastern.edu

The PhD program in network science aims to enhance our understanding of networks arising from the interplay of human behavior, sociotechnical infrastructures, information diffusion, and biological agents. This is an intrinsically multidisciplinary activity, with members of the network science community representing a wide range of fields including computer science, information science, complexity, physics, sociology, communication, organizational behavior, political science, and epidemiology. This is an interdisciplinary doctoral program focused on training students in network science across several colleges—including the College of Science, the College of Computer and Information Science, the College of Social Sciences and Humanities, Bouvé College of Health Sciences, the College of Engineering, and the College of Arts, Media and Design—with several research areas, including computational sciences, information sciences, health and life sciences, social sciences, and theoretical physics. See other collaborating colleges' catalog sections for possible concentration courses.

Course work is dependent on a student's area of concentration and subject to prior approval by their faculty advisor. Required course work includes the following: three foundational courses in network science Complex Networks and Applications (PHYS 5116) ; Network Science Data (PHYS 7331); and Dynamical Processes in Complex Networks (PHYS 7335); one of two approved courses (Social Network Analysis or Network Data Mining); 12 semester hours of elective course work defined by their specific track; and two research courses with core faculty of the program. A minimum of 32 credit hours of course work is required, though the graduate program committee may recommend additional course work based on student research interests.

Satisfactory progress in the program will be ongoing and formally evaluated at the end of both the first and second years of the program. Students are expected to maintain a cumulative GPA of 3.000 or better in all course work. Students are not allowed to retake courses. A student who does not maintain the 3.000 GPA, or is not making satisfactory progress on their dissertation research, may be recommended for termination by the graduate program committee.

Each student will have one primary research advisor from the network science doctoral program faculty.

Students will be expected to select their research advisor by the end of the spring semester of their second year in the program.

The dissertation committee consists of at least four members: the dissertation advisor, one additional network science doctoral program faculty member, one member expert in the specific topic of research (can be from outside the university), and one additional tenured/tenure-track faculty member from the concentration department/conferring college. The dissertation advisor must be a full-time tenured or tenure-track member of the Northeastern University faculty. The dissertation committee must be approved by the graduate program committee and constituted no later than the end of the spring semester of the first year of the program. Students may repeat the comprehensive examination once if they are unsuccessful.

Degree Candidacy

A student is considered a PhD candidate upon completion of all required course work with a minimum cumulative GPA of 3.000, satisfactory completion of the qualification exam, and satisfactory completion of the comprehensive exam.

Qualifying Examination

The qualification exam will be an oral examination of the material during the students' course work. The exam will be an hour in length and consist of questions selected by network science faculty who comprise the qualifying examination and dissertation committee. Students will receive 50 to 80 potential questions, which they must be prepared to answer, one month before the exam. The exam will consist of a subset of these questions. The qualifying exam will be offered twice annually, in the fall and spring term. All students are required to initially sit for the exam in the fall, typically in their third year of the PhD program. Students who do not pass the qualifying exam on their first attempt are expected to retake the exam in the spring term. Students may sit for the qualifying exam no more than twice.

Students who fail to complete the qualifying examination but who have completed all the PhD program's required course work with a cumulative GPA of 3.000 or better will be awarded a terminal Master of Science in Network Science degree. Note that no students will be admitted directly into the network science program for receipt of a master's degree.

Comprehensive Examination

Students must submit a written dissertation proposal to the qualifying examination and dissertation committee. The proposal should identify relevant literature, the research problem, the research plan, and the potential impact on the field. A presentation of the proposal will be made in an open forum, and the student must successfully defend it before the qualifying examination and dissertation committee. The comprehensive exam must precede the final dissertation defense by at least one year.

Dissertation Defense

A PhD student must complete and defend a dissertation that involves original research in network science. The dissertation defense must adhere to the College of Science policies.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review
Qualifying exam
Dissertation committee
Dissertation proposal

Dissertation defense

Core Course Work

Networks		
CS 6220	Data Mining Techniques	4
or POLS 7334	Social Networks	
PHYS 5116	Complex Networks and Applications	4
PHYS 7331	Network Science Data	4
PHYS 7335	Dynamical Processes in Complex Networks	4
Research		
Complete the following (repeatable) course twice:		
NETS 8984	Research	1-4

Specialization

Complete 12 semester hours of course work. Areas of specialization include:

COMPUTER SCIENCE

CS 6140	Machine Learning
CS 6220	Data Mining Techniques
CS 6240	Large-Scale Parallel Data Processing
CS 7800	Advanced Algorithms
NETS 7341	Network Economics

POLITICAL SCIENCE

POLS 7200	Perspectives on Social Science Inquiry
POLS 7201	Research Design
POLS 7202	Quantitative Techniques
NETS 7341	Network Economics

EPIDEMIOLOGY

PHTH 5202	Introduction to Epidemiology
PHTH 5224	Social Epidemiology
PHTH 5240	Evaluating Scientific Evidence
NETS 7341	Network Economics

ENGINEERING

EECE 7200	Linear Systems Analysis
EECE 7204	Applied Probability and Stochastic Processes
EECE 7323	Numerical Optimization Methods
EECE 7374	Fundamentals of Computer Networks
NETS 7341	Network Economics

PHYSICS

PHYS 7305	Statistical Physics
PHYS 5318	Principles of Experimental Physics
PHYS 7321	Computational Physics
PHYS 7731	Biological Physics 1

MATH

MATH 7241	Probability 1
MATH 7233	Graph Theory
MATH 7375	Topics in Topology
MATH 7733	Readings in Graph Theory
NETS 7341	Network Economics

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Applied Physics and Engineering, MS

The combined MS program in applied physics and engineering allows graduate students to receive training in one of three concentrations of the electrical and computer engineering department while also receiving fundamental graduate-level physics training that is relevant to that area.

Thesis Option

A student may complete an additional 8 semester hours of thesis. Students may register for an additional two semesters of thesis work, Thesis (EECE 7990) (4 semester hours) or Thesis (PHYS 7990) (4 semester hours), depending on the affiliation of the thesis advisor. A thesis committee is composed of an advisor and two faculty members from physics or electrical engineering.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Concentrations

Complete one of the following concentrations:

- Microsystems, Materials, and Devices (p. 147)
- Electromagnetics, Plasma, and Optics (p. 147)
- Analysis, Modeling, and Computation (p. 147)

MICROSYSTEMS, MATERIALS, AND DEVICES

Core Courses		
EECE 7201	Solid State Devices	4
PHYS 7324	Condensed Matter Physics	4
Engineering Course Work		
Complete 12 semester hours from the following:		12
EECE 5606	Micro- and Nanofabrication	
EECE 5680	Electric Drives	
EECE 5696	Energy Harvesting Systems	
EECE 7204	Applied Probability and Stochastic Processes	
EECE 7240	Analog Integrated Circuit Design	
EECE 7241	Advanced Solid State Devices	
EECE 7242	Integrated Circuits for Mixed Signals and Data Communication	
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)	
EECE 7245	Microwave Circuit Design for Wireless Communication	
EECE 7246	Design and Analysis of Digital Integrated Circuits	
EECE 7247	Radio Frequency Integrated Circuit Design	
EECE 7353	VLSI Design	
EECE 7354	VLSI Architecture	
EECE 7269	Special Topics in Electronics, Semiconductor Devices, and Microfabrication	

EECE 7276	Microwave Properties of Materials	
EECE 7284	Optical Properties of Matter	
EECE 7285	Opto-electronics and Fiber Optics	
EECE 7398	Special Topics	
Physics Course Work		
Complete 12 semester hours from the following:		12
PHYS 5114	Physics of Advanced Materials	
PHYS 5318	Principles of Experimental Physics	
PHYS 7301	Classical Mechanics/Math Methods	
PHYS 7302	Electromagnetic Theory	
PHYS 7305	Statistical Physics	
PHYS 7315	Quantum Theory 1	
PHYS 7316	Quantum Theory 2	
PHYS 7321	Computational Physics	
PHYS 7331	Network Science Data	
PHYS 7734	Topics: Condensed Matter Physics	

ELECTROMAGNETICS, PLASMA, AND OPTICS

Core Courses		
EECE 7203	Complex Variable Theory and Differential Equations	4
PHYS 7302	Electromagnetic Theory	4
Engineering Course Work		
Complete 12 semester hours from the following:		12
EECE 5648	Biomedical Optics	
EECE 5698	Special Topics in Electrical and Computer Engineering (Subsurface Imaging)	
EECE 7105	Optics for Engineers	
EECE 7202	Electromagnetic Theory 1	
EECE 7245	Microwave Circuit Design for Wireless Communication	
EECE 7270	Electromagnetic Theory 2	
EECE 7271	Computational Methods in Electromagnetics	
EECE 7274	Propagation in Artificial Structures	
EECE 7275	Antennas and Radiation	
EECE 7276	Microwave Properties of Materials	
EECE 7284	Optical Properties of Matter	
EECE 7285	Opto-electronics and Fiber Optics	
EECE 7287	Optical Detection	
EECE 7293	Modern Imaging	
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics	
Physics Course Work		
Complete 12 semester hours from the following:		12
PHYS 5318	Principles of Experimental Physics	
PHYS 7305	Statistical Physics	
PHYS 7315	Quantum Theory 1	
PHYS 7316	Quantum Theory 2	
PHYS 7321	Computational Physics	
PHYS 7324	Condensed Matter Physics	
PHYS 7731	Biological Physics 1	

ANALYSIS, MODELING, AND COMPUTATION

Core Courses		
EECE 7205	Fundamentals of Computer Engineering	4
PHYS 7321	Computational Physics	4
Engineering Course Work		
Complete 12 semester hours from the following:		12
EECE 5626	Image Processing and Pattern Recognition	
EECE 5639	Computer Vision	
EECE 5640	High-Performance Computing	
EECE 5642	Data Visualization	
EECE 5643	Simulation and Performance Evaluation	
EECE 5644	Introduction to Machine Learning and Pattern Recognition	
EECE 7205	Fundamentals of Computer Engineering	
EECE 7271	Computational Methods in Electromagnetics	
EECE 7313	Pattern Recognition	
EECE 7352	Computer Architecture	
EECE 7353	VLSI Design	
EECE 7354	VLSI Architecture	
EECE 7358	Parallel Architecture for High-Performance Computing	
EECE 7360	Combinatorial Optimization	
EECE 7374	Fundamentals of Computer Networks	
EECE 7376	Operating Systems: Interface and Implementation	
Physics Course Work		
Complete 12 semester hours from the following:		12
PHYS 5116	Complex Networks and Applications	
PHYS 5318	Principles of Experimental Physics	
PHYS 7301	Classical Mechanics/Math Methods	
PHYS 7305	Statistical Physics	
PHYS 7331	Network Science Data	
PHYS 7335	Dynamical Processes in Complex Networks	

Thesis Option

Students may register for an additional two semesters of thesis work, Thesis (EECE 7990) or Thesis (PHYS 7990) , depending on the affiliation of the thesis advisor. Thesis credits cannot be substituted for any of the course work listed above. This option requires a total of 40 semester hours for the master's degree.

Program Credit/GPA Requirements

32–40 total semester hours required
Minimum 3.000 GPA required

College of Social Sciences and Humanities

Graduate Admissions and Student Services (http://www.northeastern.edu/cssh/graduate/programs)

Uta G. Poiger, PhD, Dean
Natasha A. Frost, PhD, Associate Dean, Graduate Studies
Amy Killeen, MEd, Director, Graduate Admissions and Student Services
Sheila Magee Beare, MSCJ, Associate Director, Graduate Admissions and Student Services
Amber Crowe Connolly, MS, Administrative Coordinator, Graduate Admissions and Student Services

180 Renaissance Park
617.373.5990
617.373.7281 (fax)
gradcssh@northeastern.edu

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

Our Mission

The departments and programs of the College of Social Sciences and Humanities (CSSH)—with disciplines ranging from economics and history to English and international affairs, just to name a few—form an interdisciplinary collaborative of scholars with global perspectives. The CSSH mission is:

- To contribute to the liberal arts education of all Northeastern students
- To produce cutting-edge knowledge about and solutions to the political and social problems of our contemporary world
- To foster ethical reasoning and critical thought, with attention to the enduring significance of history, literature, and culture

This mission, along with a strong international focus, gives CSSH a central role in fulfilling Northeastern's ambition of educating global citizens.

Graduate Programs in the College of Social Sciences and Humanities

Graduate education at Northeastern integrates the highest level of scholarship across disciplinary boundaries with significant research and experiential learning opportunities. This multidimensional learning environment offers students an opportunity to develop critical thinking and creative problem-solving skills while introducing them to new perspectives in their fields. CSSH offers 13 master's programs, 7 doctoral programs, and 9 graduate certificate programs. Some courses and degree programs are offered in an online or hybrid format that is well suited for distance learners. Graduate programs in CSSH provide fertile ground and resources for advanced study and research. CSSH faculty members' cutting-edge interdisciplinary work inspires the development of new programs, research fellowship opportunities, and mentoring relationships.

Our doctoral, master's, and professional degree programs produce graduates who are well prepared for the diverse demands of careers in academia, industry, and the professions. Please visit the College of Social Sciences and Humanities (http://www.northeastern.edu/cssh/graduate) website for additional information, including latest news and upcoming events.

School of Criminology and Criminal Justice

Website (http://www.northeastern.edu/cssh/sccj)

Anthony Braga, PhD
Distinguished Professor and Director

Amy Farrell, PhD
Associate Professor and Associate Director

Gregory Zimmerman, PhD
Associate Professor and Graduate Program Director

204 Churchill Hall
617.373.3327
617.373.8723
sccj@northeastern.edu

Graduate Programs Contact
Laurie Mastone, Graduate Program Administrator, sccj@northeastern.edu

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

The School of Criminology and Criminal Justice at Northeastern University seeks to prepare students for professional and research careers in criminal justice, criminology, and related fields by applying multidisciplinary and comparative social science to understand, predict, and explain crime and contribute to the development of public policy within urban communities. Using an active-learning approach, the school seeks to develop its students intellectually and ethically, while providing them with a keen appreciation for the complexities of crime and public and private efforts to make communities safer and to ensure justice. The school offers a Graduate Certificate in Global Criminology, a Master of Science degree in criminology and criminal justice, and a PhD degree in criminology and justice policy. In addition, the School of Criminology and Criminal Justice has recently joined with the School of Law to develop two new programs: the JD/MS in criminology and criminal justice program, and the JD/PhD in criminology and justice policy program.

Programs

Doctor of Philosophy (PhD)

- Criminology and Justice Policy (p. 373)
- Criminology and Justice Policy—Advanced Entry (p. 373)

Master of Science (MS)

- Criminology and Criminal Justice (p. 374)

Dual Degrees

- Law, Criminology and Justice Policy, JD/PhD (p. 375)
- Law, Criminology and Justice Policy, JD/PhD—Advanced Entry (p. 376)
- Law and Criminal Justice, JD/MS (p. 377)

Graduate Certificate

- Global Criminology (p. 377)

Criminology and Justice Policy, PhD

The doctoral program in criminology and justice policy at the School of Criminology and Criminal Justice at Northeastern University seeks to prepare students for professional and research careers in criminal justice, criminology, and related fields by applying multidisciplinary and comparative social science to understand, predict, and explain crime and contribute to the development of public policy within urban communities. Using an active-learning approach, the school seeks to develop its students intellectually and ethically, while providing them with a keen appreciation for the complexities of crime and public and private efforts to make communities safer and to ensure justice.

The program is full time and is small and student centered. It is expected that students entering the program with a bachelor's degree will be able to complete the program in four to five years, and students entering with a master's degree will be able to complete the program in three to five years.

Year one in the doctoral program offers students an opportunity to obtain a broad foundational knowledge in the discipline: two semesters of criminological theory, two semesters of statistics, and one semester of advanced research methods. To ensure that all students have mastered the foundational material emphasized across the required courses for the PhD program and can successfully integrate theory, research, and policy, all PhD students take a "foundations" qualifying examination at the end of their first year in the doctoral program.

After demonstrating mastery of the foundational knowledge in year one, students devote themselves to a more specific area of research in year two. Students demonstrate this commitment through a second qualifying examination, which consists of two stages: an area exam and a publishable paper. The two stages of this exam are required and should be related.

Following successful completion of the first and second qualifying examinations, and required and elective course work (totaling 50 semester hours), the students proceed to a formal dissertation proposal defense.

Doctoral Degree Candidacy

A student achieves candidacy when he or she has successfully completed all course work (50 semester hours for students entering with a bachelor's degree), passed both the foundations qualifying examination and the area qualifying examination, and deposited the final version of their dissertation proposal (approved by their full committee) with the school's graduate program office. Candidacy is certified, in writing, by the college.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Two qualifying examinations—foundations and area
Annual review
PhD candidacy
Dissertation proposal
Dissertation defense

Core Requirement

A cumulative 3.000 GPA is required for the core requirement.

Criminal Justice Process		
CRIM 7202	The Criminal Justice Process	3
Policy Courses		
CRIM 7710	Criminology and Public Policy 1	3
CRIM 7711	Criminology and Public Policy 2	3
Advanced Analysis and Methods Courses		
CRIM 7713	Advanced Research and Evaluation Methods	3
CRIM 7715	Multivariate Analysis 1	3
CRIM 7716	Multivariate Analysis 2	3
Practicum in Writing		
CRIM 7706	Practicum in Writing and Publishing	2

Electives

Complete 30 semester hours in the following range:	30
CRIM 7200 to CRIM 7989	

Exam and Dissertation

Exam Preparation	
CRIM 8960	Exam Preparation—Doctoral
Dissertation	
Complete the following (repeatable) course twice:	
CRIM 9990	Dissertation
Dissertation Continuation	
Following completion of two semesters of CRIM 9990, registration in the following class is required in each semester (excluding summers) until the dissertation is completed:	
CRIM 9996	Dissertation Continuation

Program Credit/GPA Requirements

50 total semester hours required
Minimum 3.000 GPA required

Criminology and Justice Policy, PhD—Advanced Entry

The doctoral program in criminology and justice policy at the School of Criminology and Criminal Justice at Northeastern University seeks to prepare students for professional and research careers in criminal justice, criminology, and related fields by applying multidisciplinary and comparative social science to understand, predict, and explain crime and contribute to the development of public policy within urban communities. Using an active-learning approach, the school seeks to develop its students intellectually and ethically, while providing them with a keen appreciation for the complexities of crime and public and private efforts to make communities safer and to ensure justice.

The program is full time and is small and student centered. It is expected that students entering with a master's degree will be able to complete the program in three to five years.

Year one in the doctoral program offers students an opportunity to obtain a broad foundational knowledge in the discipline: two semesters of criminological theory, two semesters of statistics, and one semester of advanced research methods. To ensure that all students have mastered the foundational material emphasized across the required courses for the PhD program and can successfully integrate theory, research, and policy,

all PhD students take a "foundations" qualifying examination at the end of their first year in the doctoral program.

After demonstrating mastery of the foundational knowledge in year one, students devote themselves to a more specific area of research in year two. Students demonstrate this commitment through a second qualifying examination, which consists of two stages: an area exam and a publishable paper. The two stages of this exam are required and should be related.

Following successful completion of the first and second qualifying examinations, and required and elective course work (totaling 32 semester hours), the students proceed to a formal dissertation proposal defense.

Doctoral Degree Candidacy

A student achieves candidacy when he or she has successfully completed all course work (32 semester hours), passed the foundations qualifying examination, the area qualifying examination, and deposited the final version of their dissertation proposal (approved by their full committee) with the school's graduate program office. Candidacy is certified, in writing, by the college.

Program Requirements

Advanced Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Two qualifying examinations—foundations and area
Annual review
Dissertation proposal
Dissertation defense

Core Requirement

A cumulative 3.000 GPA is required for the core requirement.

Policy Courses		
CRIM 7710	Criminology and Public Policy 1	3
CRIM 7711	Criminology and Public Policy 2	3
Advanced Analysis and Methods Courses		
CRIM 7713	Advanced Research and Evaluation Methods	3
CRIM 7715	Multivariate Analysis 1	3
CRIM 7716	Multivariate Analysis 2	3
Practicum in Writing		
CRIM 7706	Practicum in Writing and Publishing	2

Electives

Complete 15 semester hours in the following range:	15
CRIM 7200 to CRIM 7989	

Exam and Dissertation

Exam Preparation		
CRIM 8960	Exam Preparation—Doctoral	
Dissertation		
Complete the following (repeatable) course twice:		
CRIM 9990	Dissertation	
Dissertation Continuation		

Following completion of two semesters of CRIM 9990, registration in the following class is required in each semester (excluding summers) until the dissertation is completed:

CRIM 9996	Dissertation Continuation

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Criminology and Criminal Justice, MS

The master's program in criminology and criminal justice at Northeastern University concentrates both on the problem of crime as a form of deviant behavior and on the criminal justice and private security systems that deal with it. The program emphasizes a systems approach to criminal justice, stressing policy development and analysis, as well as the impact these policies have on the individuals and organizations charged with delivering justice in a fair and equitable manner. Broad in concept and scope, it encompasses such related disciplines as law, sociology, political science, psychology, criminology, and public administration.

The master's program is comprised of required courses encompassing both substantive and technical skills. Additionally, students choose elective courses from offerings within the graduate program in criminal justice or in other graduate programs in the College of Social Sciences and Humanities. The course offerings afford students the flexibility to customize their own programs, which may include an internship, directed study, or master's thesis.

Faculty members in the graduate program represent several different academic disciplines, and teaching activities vary in nature depending on the instructors' specific objectives. The faculty's specialized interests help make possible a broad range of program offerings, including courses on the criminal justice process, victimology, security management, criminal law, juvenile justice, law and psychology, and terrorism.

Briefly stated, the graduate program endeavors to:

- Assist in developing criminal justice and private security leaders capable of assuming responsibility for policy planning and administration
- Offer students an opportunity to acquire the necessary skills and knowledge to conduct applied research while assisting them in developing the ability to apply this research in a variety of criminal justice settings
- Provide an opportunity for a solid educational foundation for those who wish to pursue more advanced graduate study beyond the Master of Science degree

Graduate study in criminology and criminal justice may be pursued on either a full- or part-time basis. All candidates for the Master of Science in Criminology and Criminal Justice degree must successfully complete a minimum of 30 semester hours of credit in course work.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirement

A cumulative 3.000 GPA is required for the core requirement.

Criminology and Criminal Justice		
CRIM 7200	Criminology	3

CRIM 7202	The Criminal Justice Process	3
Research and Statistics		
CRIM 7404	Research Methods and Statistics	3
Experiential		
CRIM 7500	Internship 1	3

Options

Complete one of the following options:

COURSE WORK OPTION

Additional Courses

Complete 18 semester hours in the following range:	18
CRIM 5000 to CRIM 7989	

THESIS OPTION

Thesis

CRIM 7990	Thesis	6

Additional Courses

Complete 12 semester hours in the following range:	12
CRIM 5000 to CRIM 7989	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Law, Criminology and Justice Policy, JD/PhD

The joint JD/PhD program will expand the knowledge base and career options of students. The disciplines of criminology and justice policy and law share common interests in identifying opportunities to create conditions for justice, equality, and societal well-being. The joint degree will provide students with a comprehensive interdisciplinary understanding of what influences criminal justice problems and the sociopolitical, legal, and economic context in which they are found. Solving problems requires interdisciplinary knowledge and an analytical and practical skill set that includes interprofessional problem solving.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Two qualifying examinations—foundations and area
Annual review
PhD candidacy
Dissertation proposal
Dissertation defense

Core Requirement

A cumulative 3.000 GPA is required for the core requirement.

Criminal Justice Process		
CRIM 7202	The Criminal Justice Process	3
Policy Courses		
CRIM 7710	Criminology and Public Policy 1	3
CRIM 7711	Criminology and Public Policy 2	3
Advanced Analysis and Methods Courses		
CRIM 7713	Advanced Research and Evaluation Methods	3
CRIM 7715	Multivariate Analysis 1	3
CRIM 7716	Multivariate Analysis 2	3
Practicum in Writing		
CRIM 7706	Practicum in Writing and Publishing	2

Electives

Complete 30 hours from the following:		30
CRIM 7201	Global Criminology	
CRIM 7208	Law and Society	
CRIM 7224	Law and Psychology	
CRIM 7232	Juvenile Law	
CRIM 7244	Criminal Law and Procedure	
CRIM 7256	Courts and Sentencing	
CRIM 7266	Crimes Against Humanity	
CRIM 7314	Special Topics in Law and Justice	
CRIM 7330	Punishment and Social Control	
CRIM 7332	International Law and Justice	
CRIM 7334	Transnational Crime	
LAW 6103	Criminal Justice	
LAW 7301	Advanced Criminal Procedure: Adjudication	
LAW 7332	Evidence	
LAW 7351	Prisoners' Rights Clinic	
LAW 7398	Federal Courts and the Federal System	
LAW 7410	Domestic Violence Clinic	
LAW 7495	Advanced Criminal Procedure: Investigation	
LAW 7526	Juvenile Courts: Delinquency, Abuse, Neglect	
LAW 7528	Balancing Liberty and Security Seminar	
LAW 7597	Civil Rights and Restorative Justice Clinic	
LAW 7612	Wrongful Convictions and Post-Conviction Remedies	
LAW 7619	Healthcare Fraud and Abuse Law	
LAW 7647	Trial Practice	

Exam and Dissertation

Exam Preparation	
CRIM 8960	Exam Preparation—Doctoral
Dissertation	
Complete the following (repeatable) course twice:	
CRIM 9990	Dissertation
Dissertation Continuation	
Following completion of two semesters of CRIM 9990, registration in the following class is required in each semester (excluding summers) until the dissertation is completed:	
CRIM 9996	Dissertation Continuation

Program Credit/GPA Requirements

50 total semester hours required for PhD. Please contact the School of Law (https://www.northeastern.edu/law/academics/jd/dual-degrees) for JD requirements.
Minimum 3.000 GPA required for PhD

Law, Criminology and Justice Policy, JD/PhD—Advanced Entry

W (https://www.northeastern.edu/cssh/sccj/graduate/phd)ebsite (http://www.northeastern.edu/cssh/sccj)

Anthony Braga, PhD
Distinguished Professor and Director, School of Criminology and Criminal Justice

Amy Farrell, PhD
Associate Professor, Associate Director, School of Criminology and Criminal Justice

Gregory Zimmerman, PhD
Associate Professor, Graduate Program Director

204 Churchill Hall
617.373.3327
617.373.8723 (fax)
sccj@northeastern.edu

Laurie Mastone, Graduate Program Administrator, sccj@northeastern.edu

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The School of Criminology and Criminal Justice at Northeastern University seeks to prepare students for professional and research careers in criminal justice, criminology, and related fields by applying multidisciplinary and comparative social science to understand, predict, and explain crime and contribute to the development of public policy within urban communities. Using an active-learning approach, the school seeks to develop its students intellectually and ethically, while providing them with a keen appreciation for the complexities of crime and public and private efforts to make communities safer and to ensure justice. The school offers a Graduate Certificate in Global Criminology, a Master of Science in Criminology and Criminal Justice, and a Doctor of Philosophy in criminology and justice policy. In addition, the School of Criminology and Criminal Justice has recently joined with the School of Law to develop two new programs: the JD/MS in Criminology and Criminal Justice program, and the JD/PhD in Criminology and Justice Policy program.

The joint JD/PhD program will expand the knowledge base and career options of students. The disciplines of criminology and justice policy and law share common interests in identifying opportunities to create conditions for justice, equality, and societal well-being. The joint degree will provide students with a comprehensive interdisciplinary understanding of what influences criminal justice problems and the sociopolitical, legal, and economic context in which they are found. Solving problems requires interdisciplinary knowledge and an analytical and practical skill set that includes interprofessional problem solving.

Program Requirements

Advanced Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Two qualifying examinations—foundations and area
Annual review
PhD candidacy
Dissertation proposal
Dissertation defense

Core Requirement

A cumulative 3.000 GPA is required for the core requirement.

Policy Courses		
CRIM 7710	Criminology and Public Policy 1	3
CRIM 7711	Criminology and Public Policy 2	3
Advanced Analysis and Methods Courses		
CRIM 7713	Advanced Research and Evaluation Methods	3
CRIM 7715	Multivariate Analysis 1	3
CRIM 7716	Multivariate Analysis 2	3
Practicum in Writing		
CRIM 7706	Practicum in Writing and Publishing	2

Electives

Complete 15 hours from the following:		15
CRIM 7201	Global Criminology	
CRIM 7208	Law and Society	
CRIM 7224	Law and Psychology	
CRIM 7232	Juvenile Law	
CRIM 7244	Criminal Law and Procedure	
CRIM 7256	Courts and Sentencing	
CRIM 7266	Crimes Against Humanity	
CRIM 7314	Special Topics in Law and Justice	
CRIM 7330	Punishment and Social Control	
CRIM 7332	International Law and Justice	
CRIM 7334	Transnational Crime	
LAW 6103	Criminal Justice	
LAW 7301	Advanced Criminal Procedure: Adjudication	
LAW 7332	Evidence	
LAW 7351	Prisoners' Rights Clinic	
LAW 7398	Federal Courts and the Federal System	
LAW 7410	Domestic Violence Clinic	
LAW 7495	Advanced Criminal Procedure: Investigation	
LAW 7526	Juvenile Courts: Delinquency, Abuse, Neglect	
LAW 7528	Balancing Liberty and Security Seminar	
LAW 7597	Civil Rights and Restorative Justice Clinic	
LAW 7612	Wrongful Convictions and Post-Conviction Remedies	
LAW 7619	Healthcare Fraud and Abuse Law	
LAW 7647	Trial Practice	

Exam and Dissertation

Exam Preparation		
CRIM 8960	Exam Preparation—Doctoral	
Dissertation		
Complete the following (repeatable) course twice:		
CRIM 9990	Dissertation	
Dissertation Continuation		

Following completion of two semesters of CRIM 9990, registration in the following class is required in each semester (excluding summers) until the dissertation is completed:

CRIM 9996	Dissertation Continuation

Program Credit/GPA Requirements

32 total semester hours required for PhD. Please contact the School of Law (https://www.northeastern.edu/law/academics/jd/dual-degrees) for JD requirements.
Minimum 3.000 GPA required for PhD

Law, Criminology and Criminal Justice, JD/MS

The joint JD/MS program will expand the knowledge base and career options of students. The disciplines of criminal justice and law share common interests in identifying opportunities to create the conditions for justice, social equality, and societal well-being. The joint degree is designed to provide students with a comprehensive interdisciplinary understanding of what influences criminal justice problems and the social, political, legal, economic context in which they are found. Solving these problems requires interdisciplinary knowledge and an analytical and practical skill set that includes interprofessional problem solving.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirement

A cumulative 3.000 GPA is required for the core requirement.

Criminology and Criminal Justice		
CRIM 7200	Criminology	3
CRIM 7202	The Criminal Justice Process	3
Research and Statistics		
CRIM 7404	Research Methods and Statistics	3
Experiential		
CRIM 7500	Internship 1	3
Law co-op will count as 3 semester hours of MS credit in lieu of CRIM 7500 internship.		

Electives

Complete 18 hours from the following:		18
CRIM 7201	Global Criminology	
CRIM 7208	Law and Society	
CRIM 7224	Law and Psychology	
CRIM 7232	Juvenile Law	
CRIM 7244	Criminal Law and Procedure	
CRIM 7256	Courts and Sentencing	
CRIM 7266	Crimes Against Humanity	
CRIM 7314	Special Topics in Law and Justice	
CRIM 7330	Punishment and Social Control	
CRIM 7332	International Law and Justice	
CRIM 7334	Transnational Crime	
LAW 6103	Criminal Justice	
LAW 7301	Advanced Criminal Procedure: Adjudication	
LAW 7332	Evidence	
LAW 7410	Domestic Violence Clinic	
LAW 7495	Advanced Criminal Procedure: Investigation	
LAW 7528	Balancing Liberty and Security Seminar	
LAW 7351	Prisoners' Rights Clinic	
LAW 7398	Federal Courts and the Federal System	
LAW 7526	Juvenile Courts: Delinquency, Abuse, Neglect	
LAW 7597	Civil Rights and Restorative Justice Clinic	
LAW 7612	Wrongful Convictions and Post-Conviction Remedies	
LAW 7619	Healthcare Fraud and Abuse Law	
LAW 7647	Trial Practice	

Program Credit/GPA Requirements

30 total semester hours required for MS. Please contact the School of Law (https://www.northeastern.edu/law/academics/jd/dual-degrees) for JD requirements.
Minimum 3.000 GPA required

Global Criminology, Graduate Certificate

The Certificate in Global Criminology is designed to respond to recent developments in the field of international and global criminology and criminal justice that require different and specific knowledge among law enforcement personnel, nongovernmental organization (NGO) staff, as well as local and national policymakers. As borders become more permeable and crime becomes more sophisticated, crime has become increasingly global. The graduate certificate highlights how globalization and internationalization affect crime and crime control, linking the supranational, the national, and local domains.

Globalization of world economies, communications, and transportation requires criminologists, criminal justice practitioners, policymakers, and law enforcement personnel to become more globally minded. This certificate program offers students an opportunity to learn how the processes of globalization influence crime and criminal justice across the globe, with emphases on globalization and recent developments in global crime; global trends in policing and security; convergence and divergence in criminal justice and penal policy; and international criminal justice, war crimes, and the global protection of human rights.

The certificate may be completed on its own or in conjunction with other graduate degree programs including, but not limited to, criminology and criminal justice, sociology, public administration, urban and regional policy, and international affairs. Students are expected to complete the four-course certificate in one year.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course		
CRIM 7201	Global Criminology	3
Electives		
Complete 9 semester hours from the following:		9
CRIM 7242	Terrorism and International Crime	
CRIM 7258	Comparative Criminology	
CRIM 7266	Crimes Against Humanity	
CRIM 7268	Human Trafficking	
CRIM 7332	International Law and Justice	
CRIM 7334	Transnational Crime	

SOCL 7272	Globalization: Social and Political Theoretical Debates
SOCL 7232	Political Economy of Global Capitalism
SOCL 7268	Globalization and the City
POLS 7369	International Security
POLS 7341	Security and Resilience Policy
POLS 7364	Terrorism, Violence, and Politics
POLS 7366	Genocide in a Comparative Perspective

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Economics

Website (http://www.northeastern.edu/cssh/economics)

William T. Dickens, PhD
University Distinguished Professor and Chair

Gregory H. Wassall, PhD
Associate Professor and Graduate Program Director

301 Lake Hall
617.373.2871
617.373.3640 (fax)
gradecon@northeastern.edu

Graduate Programs Contact
Jacquaetta Hester, Graduate Program Administrator,
j.hester@northeastern.edu

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

The Department of Economics offers both a MA and a PhD program. The most distinctive feature of these programs is their emphasis on applied economics, coupled with attention to providing a solid grounding in microeconomic and macroeconomic theory, and econometrics. Students come from all over the world, and the curriculum is designed with this in mind, striving for balance in coverage of economies that are rich and poor, large and small, mixed and market. This gives a unique flavor to the course of study, making it well-suited to the analysis of the emerging global economy of the twenty-first century.

The Master of Arts program is in applied economic policy analysis, with broad specialization areas. The program is large enough to support a full slate of core and area courses each year, yet small enough to maintain a sense of community among the students. The program is especially appropriate for those who wish to work in or return to positions in government, teaching, finance, or industry, while providing a rigorous basis for those who want to continue their studies to the doctoral level.

Our world-famous co-op system offers qualified MA students the opportunity to apply for paid work positions as practicing economists for up to six months as part of their academic program. We feel that this paid work experience enhances our MA degree and its emphasis on application. Students have an opportunity to learn how to apply their knowledge, to solve problems, and to make a difference in the world before they graduate. Our graduates either find full-time work in their area of specialty or go on to earn additional graduate degrees. All of our graduates find jobs after completing our program.

The PhD program is small and focused, and we welcome applications from those with a bachelor's or master's degree who have had prior training in macroeconomic and microeconomic theory and possess strong quantitative skills. Students take course work in ***industrial organization, competition policy, and regulatory*** and ***labor economics***.

Programs

Doctor of Philosophy (PhD)

- Economics (p. 378)
- Economics—Advanced Entry (p. 380)

Master of Arts (MA)

- Economics (p. 381)

Economics, PhD

The PhD program in applied economics is small and focused, specializing in ***industrial organization, competition policy, and regulatory economics*** and ***labor economics***.

Requirements

Students entering the doctoral program with a Master's degree in economics, please see **Economics PhD—Advanced Entry** (p. 380).

COURSE WORK

Students entering the doctoral program with a bachelor's degree will take four master's-level core classes (16 semester hours), three doctoral-level core classes (12 semester hours), two classes in each of two doctoral fields (16 semester hours), and one elective (4 semester hours), for a total program requirement of 48 semester hours. Core courses at the master's and doctoral level are focused on developing an advanced theoretical and quantitative foundation (Macroeconomic Theory, Microeconomic Theory, and Applied Econometrics). The remainder of the course work is focused on the sophisticated application of analytical tools in the chosen field of concentration.

PhD students are expected to take three classes per semester as necessary to meet the degree's course work requirements in the minimum number of semesters.

EXAMINATIONS

Two Qualifying Examinations—Macroeconomics and Microeconomics

Qualifying examinations are required upon completion of Macroeconomics 2 and Microeconomics 2. Students must receive a minimum grade of B– in the associated theory class to sit for its exam. Students are given a maximum of two attempts to pass each exam to continue in the program. Failure to sit for an exam at the appropriate time without prior consent of the graduate program director will result in an automatic fail on that exam.

One Field Comprehensive Examination

A field examination is required upon completion of the associate field classes. Students will complete course work in two fields but are required to take a field examination in one field of their choosing. Students must receive a minimum grade of B– in the associated field classes in order to sit for that field's exam. The field examination includes questions from the chosen field, as well as questions on econometrics methodology. Students are given a maximum of two attempts to pass the exam to continue in the program. Failure to sit for an exam at the appropriate time

without prior consent of the graduate program director will result in an automatic fail on that exam.

DOCTORAL DEGREE CANDIDACY

Following completion of required course work and examinations, students are certified as doctoral degree candidates (ABD). A degree candidate has a maximum of five years to defend and submit an acceptable doctoral dissertation.

DISSERTATION

The department expects that a doctoral candidate's **dissertation committee** will be formed and the dissertation proposal presented within six months of reaching degree candidacy. A dissertation committee includes a principal advisor and a minimum of two other members. The principal advisor must be a member of the economics department who holds a PhD degree and who is qualified in the chosen field. Other committee members must be qualified in the chosen field or econometrics, and one member may be from outside the department. Committee compositions must be approved by the graduate program director and department chair.

A **dissertation proposal** states the question or hypothesis, reviews the relevant literature, and explains how the proposed work will contribute to that literature and general understanding. The proposal sets forth data sources, models, and econometric issues in sufficient detail so that any faculty member not in the field will be able to assess its merits. Normally, the proposal should not exceed twenty double-spaced pages. The proposal is first approved by the dissertation committee and then presented at an open seminar.

WRITING THE DOCTORAL DISSERTATION

Writing the dissertation entails working with the principal advisor and other committee members until it is determined that a dissertation is complete, and the candidate is ready to present and defend the work at an open seminar. Candidates must arrange a date and time for the defense at least three weeks in advance. Students must familiarize themselves with the Guide to the Preparation of Theses and Dissertations (https://www.northeastern.edu/cssh/graduate/commencement/formatting-guidelines). The guide provides links to formatting tips, sample introductory pages, sample approval record, and deadlines. In addition, a checklist is provided to ensure students have fulfilled the required steps in the commencement clearance process.

MILESTONES

Maintaining satisfactory academic progress during doctoral candidacy requires the following:

PhD Annual Student Progress Review

Each PhD student will have an annual review of his or her progress toward the degree. Receipt of financial support administered by the graduate school is contingent upon satisfactory academic progress toward the degree and satisfactory performance in assigned duties. See the CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students) for further details.

Field Lunch Participation

All PhD students registered for Doctoral Dissertation or Continuation who are in residence are expected to regularly attend a field seminar in industrial organization or labor. These seminars meet roughly every week, and their purpose is to assist students in choosing and evaluating dissertation topics as well as advancing and completing their dissertation. All doctoral candidates will be expected to present their research at various stages of writing their dissertation.

Seminar Series Participation

All PhD students registered for Doctoral Dissertation or Continuation who are in residence are expected to regularly attend academic seminars by speakers invited to campus through the Department of Economics Seminar Series. Participation in these seminars is an important component of doctoral training and is intended to expose students to current research in their field while helping to develop and hone their own presentation skills.

Practical Experience in Applied Economics Program

Participation in at least one semester of the Practical Experience in Applied Economics program is required of all students who have reached doctoral candidacy. The program is offered in the spring semester every other year. In this program, a variety of prominent practitioners working in consulting and government agencies in the fields of industrial organization and labor will describe their practical experience applying economics to a variety of consulting and policy problems, including antitrust, regulation, labor market policy, education, and health policy. This is a participatory class that will require advanced reading and preparation of questions for the practitioners in addition to other assignments.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Two qualifying examinations—microeconomics and macroeconomics
Field comprehensive examination (student chooses field)
Doctoral degree candidacy
PhD annual student progress review
Dissertation committee
Dissertation proposal
Dissertation defense
Field lunch participation
Seminar series participation

Core and Field Requirements

Quantitative Courses		
ECON 5105	Math and Statistics for Economists	4
ECON 5140	Applied Econometrics	4
ECON 7740	Applied Econometrics 2	4
Theory Courses		
ECON 5110	Microeconomic Theory	4
ECON 5120	Macroeconomic Theory	4
ECON 7710	Microeconomic Theory 2	4
ECON 7720	Macroeconomic Theory 2	4
Field Courses		
Labor Economics Field		
ECON 7763	Labor Market Analysis	4
ECON 7764	Topics in Labor Economics	4
Industrial Organization Field		
ECON 7771	Framework of Industrial Organization	4
ECON 7772	Public Policy Toward Business	4

Elective

Complete 4 semester hours from the following:		4
ECON 5200 to ECON 5299		
ECON 7200 to ECON 7299		
ECON 7976	Directed Study	
ECON 8982	Readings	

Field Exam and Writing the Dissertation

Registration in the following class is required in the semester prior to sitting for the field examination:

ECON 8960	Exam Preparation—Doctoral

Registration in the following class is required in the semester that students sit for the field examination and begin dissertation planning:

ECON 9986	Research

Registration in the following class is required in the fall and spring semesters following achievement of doctoral candidacy:

ECON 9990	Dissertation

Following completion of two semesters of ECON 9990, registration in the following class is required in each semester (excluding summers) until the dissertation is completed:

ECON 9996	Dissertation Continuation

Program Credit/GPA Requirements

- 48 total semester hours required
- Minimum 3.000 GPA required

Economics, PhD—Advanced Entry

The PhD program in applied economics is small and focused, specializing in ***industrial organization, competition policy, and regulatory economics*** and ***labor economics***.

Requirements

Students entering the doctoral program without a master's degree, please see **Economics PhD** (p. 378)**.**

COURSE WORK

Students entering the doctoral program with a master's degree will take three doctoral-level core classes (12 semester hours), two classes in each of two doctoral fields (16 semester hours), and one elective (4 semester hours), for a total program requirement of 32 semester hours. If the master's degree is not in economics, additional course work may be required in order to meet course prerequisites. Core courses are focused on developing an advanced theoretical and quantitative foundation (macroeconomic theory, microeconomic theory, and applied econometrics). The remainder of the course work is focused on the sophisticated application of analytical tools in the chosen field of concentration.

PhD students are expected to take three classes per semester as necessary to meet the degree's course work requirements in the minimum number of semesters.

EXAMINATIONS

Two Qualifying Examinations—Macroeconomics and Microeconomics

Qualifying examinations are required upon completion of Macroeconomics 2 and Microeconomics 2. Students must receive a minimum grade of B–in the associated theory class to sit for its exam. Students are given a maximum of two attempts to pass each exam to continue in the program. Failure to sit for an exam at the appropriate time without prior consent of the graduate program director will result in an automatic fail on that exam.

One Field Comprehensive Examination

A field examination is required upon completion of the associate field classes. Students will complete course work in two fields but are required to take a field examination in one field of their choosing. Students must receive a minimum grade of B– in the associated field classes in order to sit for that field's exam. The field examination includes questions from the chosen field, as well as questions on econometrics methodology. Students are given a maximum of two attempts to pass the exam to continue in the program. Failure to sit for an exam at the appropriate time without prior consent of the graduate program director will result in an automatic fail on that exam.

DOCTORAL DEGREE CANDIDACY

Following completion of required course work and examinations, students are certified as doctoral degree candidates (ABD). A degree candidate has a maximum of five years to defend and submit an acceptable doctoral dissertation.

DISSERTATION

COMMITTEE AND PROPOSAL

The department expects that a doctoral candidate's dissertation committee will be formed and the dissertation proposal presented within six months of reaching degree candidacy.

A **dissertation committee** includes a principal advisor and a minimum of two other members. The principal advisor must be a current member of the economics department who holds a PhD degree and who is qualified in the chosen field. Other committee members must be qualified in the chosen field or econometrics, and one member may be from outside the department. Committee compositions must be approved by the graduate program director and department chair.

A **dissertation proposal** states the question or hypothesis, reviews the relevant literature, and explains how the proposed work will contribute to that literature and general understanding. The proposal sets forth data sources, models, and econometric issues in sufficient detail so that any faculty member not in the field will be able to assess its merits. Normally, the proposal should not exceed twenty double-spaced pages. The proposal is first approved by the dissertation committee and then presented at an open seminar.

WRITING THE DOCTORAL DISSERTATION

Writing the dissertation entails working with the principal advisor and other committee members until it is determined that a dissertation is complete, and the candidate is ready to present and defend the work at an open seminar. Candidates must arrange a date and time for the defense at least three weeks in advance. Students must familiarize themselves with the Guide to the Preparation of Theses and Dissertations (https://www.northeastern.edu/cssh/graduate/commencement/formatting-guidelines). The guide provides links to formatting tips, sample introductory pages, sample approval record, and deadlines. In addition, a checklist is provided to ensure students have fulfilled the required steps in the commencement clearance process.

MILESTONES

Maintaining satisfactory academic progress during doctoral candidacy requires the following:

PhD Annual Student Progress Review
Each PhD student will have an annual review of his or her progress toward the degree. Receipt of financial support administered by the college is contingent upon satisfactory academic progress toward the degree and satisfactory performance in assigned duties. See the College of Social Sciences and Humanities Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students) for further details.

Field Lunch Participation
All PhD students registered for Doctoral Dissertation or Continuation who are in residence are expected to regularly attend a field seminar in industrial organization or labor. These seminars meet roughly every week, and their purpose is to assist students in choosing and evaluating dissertation topics as well as advancing and completing their dissertation. All doctoral candidates will be expected to present their research at various stages of writing their dissertation.

Seminar Series Participation
All PhD students registered for Doctoral Dissertation or Continuation who are in residence are expected to regularly attend academic seminars by speakers invited to campus through the Department of Economics Seminar Series. Participation in these seminars is an important component of doctoral training and is intended to expose students to current research in their field while helping to develop and hone their own presentation skills.

Practical Experience in Applied Economics Program
Participation in at least one semester of the Practical Experience in Applied Economics program is required of all students who have reached doctoral candidacy. The program is offered in the spring semester every other year. In this program, a variety of prominent practitioners working in consulting and government agencies in the fields of industrial organization and labor will describe their practical experience applying economics to a variety of consulting and policy problems, including antitrust, regulation, labor market policy, education, and health policy. This is a participatory class that will require advanced reading and preparation of questions for the practitioners in addition to other assignments.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Two qualifying examinations—microeconomics and macroeconomics
Field comprehensive examination (student chooses field)
Doctoral degree candidacy
PhD annual student progress review
Dissertation committee
Dissertation proposal
Dissertation defense
Field lunch participation
Seminar series participation

Core and Field Requirements

Quantitative Courses		
ECON 7740	Applied Econometrics 2	4
Theory Courses		
ECON 7710	Microeconomic Theory 2	4
ECON 7720	Macroeconomic Theory 2	4
Field Courses		
Labor Economics Field		
ECON 7763	Labor Market Analysis	4
ECON 7764	Topics in Labor Economics	4
Industrial Organization Field		
ECON 7771	Framework of Industrial Organization	4
ECON 7772	Public Policy Toward Business	4
Elective Course		
Complete 4 semester hours from the following:		4
ECON 7200 to ECON 7299		
ECON 7976	Directed Study	
ECON 8982	Readings	

Field Exam and Writing the Dissertation

Registration in the following class is required in the semester prior to sitting for the field examination:

ECON 8960	Exam Preparation—Doctoral

Registration in the following class is required in the semester that students sit for the field examination and begin dissertation planning:

ECON 9986	Research

Registration in the following class is required in the fall and spring semesters following achievement of doctoral candidacy:

ECON 9990	Dissertation

Following completion of two semesters of ECON 9990, registration in the following class is required in each semester (excluding summers) until the dissertation is completed:

ECON 9996	Dissertation Continuation

Program Credit/GPA Requirements

- 32 total semester hours required
- Minimum 3.000 GPA required

Economics, MA

The Master of Arts program is in applied economic policy analysis, with broad specialization areas. The program is large enough to support a full slate of core and area courses each year, yet small enough to maintain a sense of community among the students. The program is especially appropriate for those who wish to work in or return to positions in government, teaching, finance, or industry, while providing a rigorous basis for those who want to continue their studies to the doctoral level.

We offer the opportunity for master's students to apply for paid work positions through Northeastern's world-famous co-op program. Qualified and approved master's students can participate in co-op as practicing economists for up to six months as part of their academic program. This paid work experience enhances the degree and its emphasis on application. Students have an opportunity to learn how to apply their knowledge, to solve problems, and to make a difference in the world before they graduate. Our graduates either find full-time work in their area of specialty or go on to earn additional graduate degrees. All of our graduates find jobs after completing our program. For more information, please visit economics co-op (https://www.northeastern.edu/cssh/economics/undergraduate/experiential-learning/co-op).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Quantitative Courses		
ECON 5105	Math and Statistics for Economists	4
ECON 5140	Applied Econometrics	4
Theory Courses		
ECON 5110	Microeconomic Theory	4
ECON 5120	Macroeconomic Theory	4

Electives

With prior approval from the graduate program director, the following courses may substitute for electives: Thesis (ECON 7990) or Internship In Economics (ECON 8550). Additionally, a student may select a maximum of four graduate semester hours offered by other departments.

Complete 16 semester hours in the following range:	16
ECON 5200 to ECON 7772	

Program Credit/GPA Requirements

- 32 total semester hours required
- Minimum 3.000 GPA required
-
-
-

English

Website (http://www.northeastern.edu/cssh/english/graduate)

Elizabeth Maddock Dillon, PhD
Professor and Chair
e.dillon@northeastern.edu

Theo Davis, PhD
Associate Professor and Graduate Program Director
th.davis@northeastern.edu

405 Lake Hall
617.373.3692
617.373.2509 (fax)
gradenglish@northeastern.edu

Graduate Programs Contact
Melissa Daigle, Graduate Program Administrator,
m.daigle@northeastern.edu

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

The graduate program in English is grounded in the study of British and American literature through the most current modes of humanistic inquiry and in the disciplines of writing and rhetoric. Both in course work and through the NULab for Texts, Maps, and Networks (http://www.northeastern.edu/nulab), the graduate program in English also offers training in the digital humanities. Altogether, our degree programs provide a challenging, flexible, and wide-ranging education in English studies today.

-

Programs

Doctor of Philosophy (PhD)

- English (p. 382)
- English—Advanced Entry (p. 384)

Master of Arts (MA)

- English (p. 384)

Graduate Certificate

- Digital Humanities (p. 385)

English, PhD

The PhD program seeks to train students to be productive scholars and teachers in the fields of both literary studies and rhetoric and composition. In course work, students read and analyze the important texts, current issues, and critical methodologies of the discipline. Drawing on the breadth of this preparation, students demonstrate their ability to recognize and produce scholarly arguments in designing the three comprehensive field papers in areas of scholarly interest and competence corresponding to recognized and emerging fields of study. Finally, the dissertation offers students an opportunity to design a focused research project in consultation with a dissertation advisor. Throughout the program, faculty works closely with doctoral students to develop their scholarly and professional identities in preparation for careers in academia.

Academic Standing/Progress

To be considered in good academic standing, PhD students must be making progress toward their degree requirements, including maintaining a 3.500 minimum cumulative grade-point average (GPA) and completing the comprehensive examination within one year of finishing course work.

Doctoral Degree Candidacy

Students entering with a relevant BA must complete 42 semester hours, complete the language requirement, and pass the comprehensive examination.

General Regulations

Program requirements are described in the CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students) and the Graduate Program in English PhD Guide (https://www.northeastern.edu/cssh/english/graduate/current-student-resources). Both documents are updated annually.

Program Requirements

Bachelor's Degree Entrance

Milestones

Annual progress review
Two languages
Comprehensive exam
Doctoral degree candidacy
Dissertation prospectus
Public prospectus/dissertation work-in-progress presentation
Dissertation defense

Course Work

Proseminar		
ENGL 5103	Proseminar	3
Writing and the Teaching of Writing		
ENGL 7392	Writing and the Teaching of Writing	3

Theories and Methods

Complete 6 semester hours from the following:		6
ENGL 7341	Contemporary Critical Theory	
ENGL 7342	Topics in Criticism	
ENGL 7351	Topics in Literary Study (selected topics only)	
ENGL 7358	Topics in Literature and other Disciplines (selected topics only)	
ENGL 7370	Topics in Digital Humanities	
ENGL 7379	Ethnography	
WMNS 6100	Theorizing Gender and Sexuality	
WMNS 7976	Directed Study (GCWS Consortium, selected topics only)	

Rhetoric and Composition

Complete 3 semester hours from the following:		3
ENGL 7111	Rhetorical Theory	
ENGL 7112	Rhetorical Criticism	
ENGL 7121	Composition Studies	
ENGL 7123	Approaches to Teaching Writing	
ENGL 7360	Topics in Rhetoric	
ENGL 7391	Reading and the Teaching of Reading	
ENGL 7392	Writing and the Teaching of Writing	
ENGL 7393	Writing and Learning Across Curriculum	
ENGL 7395	Topics in Writing	
ENGL 7396	Composition Pedagogy	
ENGL 7397	Responding to Learners	
ENGL 7398	Writing and Reading in Content Areas	

Medieval and Renaissance

Complete 3 semester hours from the following:		3
ENGL 7261	Medieval Literature	
ENGL 7262	Renaissance Literature	
ENGL 7271	Chaucer	
ENGL 7272	Shakespeare's Tragedies	
ENGL 7273	Shakespeare's Comedies	
ENGL 7274	Topics in Shakespeare	
ENGL 7281	Topics in Medieval Literature	
ENGL 7282	Topics in Renaissance Literature	
ENGL 7342	Topics in Criticism (selected topics only)	
ENGL 7358	Topics in Literature and other Disciplines (selected topics only)	

Seventeenth and Eighteenth Century

Complete 3 semester hours from the following:		3
ENGL 7213	Topics in Early American Literature	
ENGL 7263	17th-Century Literature	
ENGL 7264	Restoration and Early 18th-Century Literature	
ENGL 7275	Milton	
ENGL 7283	Topics in 17th-Century Literature	
ENGL 7284	Topics in 18th-Century Literature	
ENGL 7291	18th-Century Novel	
ENGL 7351	Topics in Literary Study (selected topics only)	
ENGL 7352	Topics in Genre (selected topics only)	

Nineteenth and Twentieth Century

Complete 3 semester hours from the following:		3
ENGL 7211	Topics in American Literature (selected topics only)	
ENGL 7212	Topics in African-American Literature (selected topics only)	
ENGL 7214	Topics in 19th-Century American Literature	
ENGL 7215	Topics in 20th-Century American Literature	
ENGL 7221	Major American Novelist	
ENGL 7222	Major American Playwright (selected versions of this course)	
ENGL 7223	Major American Poet (selected versions of this course)	
ENGL 7224	Major Figures in African-American Literature	
ENGL 7233	19th-Century American Poetry	
ENGL 7244	African-American Novel	
ENGL 7251	Contemporary American Fiction	
ENGL 7266	Victorian Literature	
ENGL 7285	Topics in Romanticism	
ENGL 7286	Topics in Victorian Literature	
ENGL 7287	Topics in 20th-Century British Literature	
ENGL 7292	Romantic Poetry	
ENGL 7293	Victorian Poetry	
ENGL 7294	Victorian Novel	
ENGL 7351	Topics in Literary Study (selected topics only)	
ENGL 7355	Topics in Poetry (selected topics only)	
ENGL 7358	Topics in Literature and other Disciplines (selected topics only)	
ENGL 7359	Topics in Comparative Literature (selected topics only)	
ENGL 7361	Modern Poetry	
ENGL 7362	Contemporary Poetry	

Open Electives

Complete 18 semester hours in the following subject area:		18
ENGL or approved non-ENGL courses (e.g., INSH 7910, WMNS 7976).		

Exam and Dissertation

Exam Preparation

ENGL 8960	Exam Preparation—Doctoral

Research

ENGL 9986	Research

Dissertation

Complete the following (repeatable) course twice:	
ENGL 9990	Dissertation

Program Credit/GPA Requirements

- 42 total semester hours required
- Minimum 3.500 GPA required

English, PhD—Advanced Entry

The PhD program seeks to train students to be productive scholars and teachers in the fields of both literary studies and rhetoric and composition. In course work, students read and analyze the important texts, current issues, and critical methodologies of the discipline. Drawing on the breadth of this preparation, students demonstrate their ability to recognize and produce scholarly arguments in designing the three comprehensive field papers in areas of scholarly interest and competence corresponding to recognized and emerging fields of study. Finally, the dissertation offers students an opportunity to design a focused research project in consultation with a dissertation advisor. Throughout the program, faculty works closely with doctoral students to develop their scholarly and professional identities in preparation for careers in academia.

Academic Standing/Progress

To be considered in good academic standing, PhD students must be making progress toward their degree requirements, including maintaining a 3.500 minimum cumulative grade-point average (GPA) and completing the comprehensive examination within one year of finishing course work.

Doctoral Degree Candidacy

Students entering with a relevant MA must complete 21 semester hours, complete the language requirement, and pass the comprehensive examination.

General Regulations

Program requirements are described in the CSSH Graduate Programs General Regulations and the Graduate Program in English PhD Guide. The General Regulations booklet is created by the College of Social Sciences and Humanities graduate office. It reviews the minimum academic requirements established by the university and the graduate office. The PhD Guide is created by the Department of English graduate office. It reviews requirements and procedures that are specific to the doctoral program in English. Both documents are updated annually.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual progress review
Two languages
Comprehensive exam
Doctoral degree candidacy
Dissertation prospectus
Public prospectus/dissertation work-in-progress presentation
Dissertation defense

Course Work

Proseminar		
ENGL 5103	Proseminar	3
Writing and the Teaching of Writing		
ENGL 7392	Writing and the Teaching of Writing	3
Open Electives		
Complete 15 semester hours of ENGL courses.		15

Exam and Dissertation

Exam Preparation		
ENGL 8960	Exam Preparation—Doctoral	
Research		
ENGL 9986	Research	
Dissertation		
Complete the following (repeatable) course twice:		
ENGL 9990	Dissertation	

Program Credit/GPA Requirements

21 total semester hours required
Minimum 3.500 GPA required

English, MA

The Master of Arts degree launches students into the study of literature, writing, and rhetoric at the graduate level. The program offers two years of intensive study in the major fields of British and American literature, covering the debates and approaches that animate the discipline of English. Our MA graduates are fully prepared to proceed to study at the doctoral level, and their training in critical thinking, language skills, and cultural history has also proven to be fruitful preparation for a range of careers outside of academia.

Academic Standing/Progress

To be considered in good academic standing, MA students must be making progress toward their degree requirements, including maintaining a 3.000 minimum cumulative grade-point average (GPA).

General Regulations

Program requirements are described in the CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students) and the Graduate Program in English MA Guide (https://www.northeastern.edu/cssh/english/graduate/current-student-resources). Both documents are updated annually.

Program Requirements

Milestones

Annual progress review
One language
Comprehensive examination (timed examination and thesis options)

Course Work

Proseminar		
ENGL 5103	Proseminar	3
Theories and Methods		
Complete 6 semester hours from the following:		6
ENGL 7341	Contemporary Critical Theory	
ENGL 7342	Topics in Criticism	
ENGL 7351	Topics in Literary Study (selected topics only)	
ENGL 7358	Topics in Literature and other Disciplines (selected topics only)	
ENGL 7370	Topics in Digital Humanities	
ENGL 7379	Ethnography	
WMNS 6100	Theorizing Gender and Sexuality	
WMNS 7976	Directed Study (GCWS Consortium, selected topics only)	
Writing and Rhetoric		
Complete 6 semester hours from the following:		6
ENGL 7111	Rhetorical Theory	
ENGL 7112	Rhetorical Criticism	

ENGL 7121	Composition Studies	
ENGL 7123	Approaches to Teaching Writing	
ENGL 7360	Topics in Rhetoric	
ENGL 7391	Reading and the Teaching of Reading	
ENGL 7392	Writing and the Teaching of Writing (Master's students may register with permission from the instructor.)	
ENGL 7393	Writing and Learning Across Curriculum	
ENGL 7395	Topics in Writing	
ENGL 7396	Composition Pedagogy	
ENGL 7397	Responding to Learners	
ENGL 7398	Writing and Reading in Content Areas	
Medieval and Renaissance		
Complete 3 semester hours from the following:		3
ENGL 7261	Medieval Literature	
ENGL 7262	Renaissance Literature	
ENGL 7271	Chaucer	
ENGL 7272	Shakespeare's Tragedies	
ENGL 7273	Shakespeare's Comedies	
ENGL 7274	Topics in Shakespeare	
ENGL 7281	Topics in Medieval Literature	
ENGL 7282	Topics in Renaissance Literature	
ENGL 7342	Topics in Criticism (selected topics only)	
ENGL 7358	Topics in Literature and other Disciplines (selected topics only)	
Seventeenth and Eighteenth Centuries		
Complete 3 semester hours from the following:		3
ENGL 7213	Topics in Early American Literature	
ENGL 7263	17th-Century Literature	
ENGL 7264	Restoration and Early 18th-Century Literature	
ENGL 7275	Milton	
ENGL 7283	Topics in 17th-Century Literature	
ENGL 7284	Topics in 18th-Century Literature	
ENGL 7291	18th-Century Novel	
ENGL 7351	Topics in Literary Study (selected topics only)	
ENGL 7352	Topics in Genre (selected topics only)	
Nineteenth and Twentieth Centuries		
Complete 3 semester hours from the following:		3
ENGL 7211	Topics in American Literature (selected topics only)	
ENGL 7212	Topics in African-American Literature (selected topics only)	
ENGL 7214	Topics in 19th-Century American Literature	
ENGL 7215	Topics in 20th-Century American Literature	
ENGL 7221	Major American Novelist	
ENGL 7222	Major American Playwright (selected versions of this course)	
ENGL 7223	Major American Poet (selected versions of this course)	
ENGL 7224	Major Figures in African-American Literature	
ENGL 7233	19th-Century American Poetry	
ENGL 7244	African-American Novel	
ENGL 7251	Contemporary American Fiction	
ENGL 7266	Victorian Literature	
ENGL 7285	Topics in Romanticism	
ENGL 7286	Topics in Victorian Literature	
ENGL 7287	Topics in 20th-Century British Literature	
ENGL 7292	Romantic Poetry	
ENGL 7293	Victorian Poetry	
ENGL 7294	Victorian Novel	
ENGL 7351	Topics in Literary Study (selected topics only)	
ENGL 7355	Topics in Poetry (selected topics only)	
ENGL 7358	Topics in Literature and other Disciplines (selected topics only)	
ENGL 7359	Topics in Comparative Literature (selected topics only)	
ENGL 7361	Modern Poetry	
ENGL 7362	Contemporary Poetry	

Timed Examination Option

Open Electives		
Complete 6 semester hours of ENGL courses or approved non-ENGL course (e.g., INSH 7910, WMNS 7976).		6
Exam Preparation		
Required for students who must maintain full-time status while completing the comprehensive examination.		
ENGL 6960	Exam Preparation—Master's	0

Thesis Option

A minimum 3.500 GPA is required to pursue this option.

Open Elective		
Complete 3 semester hours of ENGL courses or approved non-ENGL courses (e.g., INSH 7910, WMNS 7976).		3
Thesis		
ENGL 7990	Thesis (minimum 3.500 GPA required)	3
Exam Preparation		
Required for students who must maintain full-time status while completing the MA Thesis.		
ENGL 6960	Exam Preparation—Master's	0

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Digital Humanities, Graduate Certificate

Elizabeth Maddock Dillon, PhD
Certificate Co-Director
e.dillon@northeastern.edu

Julia Flanders, PhD
Certificate Co-Director
j.flanders@northeastern.edu

Sarah Connell, PhD
Certificate Administrator

sa.connell@northeastern.edu

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Graduate Certificate in Digital Humanities allows students to pursue an organized course of study in digital humanities with the interdisciplinary faculty of the NULab for Texts, Maps, and Networks (http://www.northeastern.edu/nulab) while completing requirements for their degrees in existing Northeastern University doctoral and master's programs. *This is not a stand-alone certificate*; rather, it will be completed by students in the course of their existing program of study.

Digital humanities (DH) is an emerging field of research that is interdisciplinary in scope and collaborative in nature. The field is developing in relation to new digital technologies that have changed the objects of study, methods, and opportunities for research and teaching in existing humanities fields. Digitized texts are now read and accessed in new ways; digitized corpora of texts make possible new modes of quantitative and qualitative analysis (including "distant reading," text mining, mapping, and network analysis); born digital objects constitute new primary sources in need of humanistic theorization, approaches, and critical vocabularies; and modes of encoding, aggregating, and connecting texts enable the creation of new archival resources that are changing our understanding of the archive itself as well revealing new historical, literary, and cultural patterns.

The field is new and developing rapidly and many students are eager for training in this area—both because DH is at the cutting edge of disciplinary work and because it offers new opportunities for employment within the academy and outside of it.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose GPA falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Final Project

The student will complete a final independent DH research project located in the student's home program (such as a thesis, or a portion thereof) or participation in a collaborative DH project with substantial student participation. The final project will be overseen by the NULab faculty members teaching the NULab Project Seminar during its development; NULab workshop instructors will advise students on their projects and help students get guidance from other faculty as appropriate. Final projects will be submitted with three components: the project itself, a written project description of about 2,000 words, and a presentation to the NULab community. The DH certificate committee will formally approve all final projects.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Topics/Readings/Methods		
ENGL 7370	Topics in Digital Humanities (Introduction to Digital Humanities)	3
or HIST 7370	Texts, Maps, and Networks: Readings and Methods for Digital History	
Lab Project Seminar		
Complete the following (repeatable) course three times:		3
INSH 7910	NULab Project Seminar	
Electives [1]		
Complete 6 semester hours from the following:		6
Independent Study, Research Project, or Thesis within student's home program		
ARTG 5100	Information Design Studio 1: Principles	
ARTG 5120	Information Design Research Methods	
CS 6120	Natural Language Processing	
ENGL 7370	Topics in Digital Humanities	
ENGL 7990	Thesis (for MA students in English; requires approval by the DH certificate program director)	
HIST 7219	Topics in Cultural History	
POLS 7334	Social Networks	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	

Program Credit/GPA Requirements

Minimum 12 total semester hours required
Minimum 3.000 GPA required

[1] By petition, one course outside the electives list may count as an elective with approval from the instructor and the DH certificate program director.

History

Website (https://www.northeastern.edu/cssh/history/graduate/programs)

Heather Streets-Salter, PhD
Associate Professor and Chair

Katherine Luongo, PhD
Associate Professor and Graduate Program Director, PhD and MA (World History)

Martin Blatt, PhD
Professor of the Practice and Graduate Program Director, MA (Public History)

249 Meserve Hall
617.373.2662
617.373.3661 (fax)
gradhistory@northeastern.edu

Graduate Programs Contact
Bonne Knipfer, Graduate Program Administrator,
b.knipfer@northeastern.edu

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

Graduate work in history focuses on global and world history, which study the interactions among geographical regions and historical processes around the globe. Students at both the master's and doctoral levels concentrate their work on the history of regions or peoples in Africa, Asia, Europe, Latin America, or the United States, with attention to the intersections and connections between national, regional, and global

developments. The Department of History also offers a master's degree with a concentration in public history that emphasizes the study of topics such as material culture, historical exhibits and museums, historical agencies, and archival administration. Recent doctoral students have been the recipients of major fellowships for conducting dissertation research abroad, including Fulbright, Fulbright-Hays, Social Science Research Council, and Chateaubriand fellowships.

Programs

Doctor of Philosophy (PhD)

- History (p. 387)
- History—Advanced Entry (p. 387)

Master of Arts (MA)

- History (p. 388)

Graduate Certificate

- Public History (p. 389)

History, PhD

The PhD program, with a focus on global, transnational, and comparative history, seeks to train research historians who plan to teach at the college and university level. Systematic training in theory and methodology and preparation for college teaching are distinctive features of the Northeastern program.

Academic Standing/Progress

Students are required to maintain an overall GPA of at least 3.500. In addition, the PhD annual review is based on a report by the student's advisor, with attention to:

1. Success in setting up a doctoral committee
2. Passing the departmental language examination in the language of their field
3. Successful performance of teaching assistant duties
4. Successful completion of courses in the tiered system (i.e., the required course sequence)
5. Successful completion, where appropriate, of other required activities, including construction of the comprehensive examination list and the dissertation proposal and scheduling of comprehensive examinations

Doctoral Degree Candidacy

Students entering without an MA in history must complete 37 semester hours and must pass the qualifying examination by the end of the third year in the program. Upon completion of these two requirements, students will be deemed PhD degree candidates by the college.

Program Requirements

Milestones

Qualifying examination
Annual review
Language
PhD candidacy
Dissertation committee
Dissertation proposal
Dissertation defense

Major Requirements

Theory and Methodology		
A grade of B or higher is required:		
HIST 5101	Theory and Methodology 1	3
HIST 5102	Theory and Methodology 2	3
Digital History		
HIST 7370	Texts, Maps, and Networks: Readings and Methods for Digital History	3
Readings or Directed Study		
Complete 18 semester hours in either Readings or Directed Study:		18
HIST 8982	Readings	
or HIST 7976	Directed Study	
Research Seminar		
HIST 7314	Research Seminar in World History	3
Teaching Practicum		
HIST 8409	Practicum in Teaching	1

Electives

Complete 6 semester hours from the following range:	6
HIST 7200 to HIST 7702	

Exam and Dissertation

Exam Preparation		
HIST 8960	Exam Preparation—Doctoral	
Dissertation		
Complete the following (repeatable) course twice:		
HIST 9990	Dissertation	

Program Credit/GPA Requirements

37 total semester hours required
Minimum 3.500 GPA required

History, PhD—Advanced Entry

The PhD program, with a focus on global, transnational, and comparative history seeks to train research historians who plan to teach at the college and university level. Systematic training in theory and methodology and preparation for college teaching are distinctive features of the Northeastern program.

Academic Standing/Progress

Students are required to maintain an overall GPA of at least 3.500. In addition, the PhD annual review is based on a report by the student's advisor, with attention to:

1. Success in setting up a doctoral committee
2. Passing the departmental language examination in the language of their field
3. Successful performance of teaching assistant duties
4. Successful completion of courses in the tiered system (i.e., the required course sequence)
5. Successful completion, where appropriate, of other required activities, including construction of the comprehensive examination list and the dissertation proposal and scheduling of comprehensive examinations

Doctoral Degree Candidacy

Students entering with an MA in history from outside Northeastern must complete 31 semester hours and must pass the qualifying examination by the end of the third year in the program. Upon completion of these two

requirements, students will be certified as PhD degree candidates by the college.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Language
PhD Candidacy
Dissertation committee
Dissertation proposal
Dissertation defense

Major Requirements

Theory and Methodology		
A grade of B or higher is required:		
HIST 5101	Theory and Methodology 1	3
HIST 5102	Theory and Methodology 2	3
Digital History		
HIST 7370	Texts, Maps, and Networks: Readings and Methods for Digital History	3
Readings or Directed Study		
Complete 12 semester hours of either Readings or Directed Study:		12
HIST 8982	Readings	
or HIST 7976	Directed Study	
Research Seminar		
HIST 7314	Research Seminar in World History	3
Teaching Practicum		
HIST 8409	Practicum in Teaching	1

Electives

Complete 6 semester hours from the following range:	6
HIST 7200 to HIST 7702	

Exam and Dissertation

Exam Preparation		
HIST 8960	Exam Preparation—Doctoral	
Dissertation		
Complete the following (repeatable) course twice:		
HIST 9990	Dissertation	

Program Credit/GPA Requirements

31 total semester hours required
Minimum 3.500 GPA required

History, MA

The Master of Arts in History offers two concentrations: public history and world history.

Public history encompasses the practice of history outside the academy in museums, state and local historical societies, archives, the National Park Service, and more. Public history includes the study of such topics as material culture, historical exhibits and museums, historical agencies, archival administration, and how difficult issues including slavery and site of violence are presented to the public.

World history focuses on the history of regions or peoples in Africa, Europe, Latin America, Asia, or the United States, with attention to the intersections and connections between national, regional, and global developments.

Academic Standing/Progress

Students are expected to maintain a 3.000 grade-point average (GPA). Should the GPA drop below 3.000, the student will be placed on academic probation and allowed one more semester to bring his or her GPA to the 3.000 level. If the student is not able to meet this requirement by the end of the following semester, the student may be asked to leave the program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

The Master of Arts in History offers two concentrations: world history and public history. The program requires a concentration. Please consult with a Department of History graduate program director for additional details.

Major Requirements for Concentration in World History

Theory and Methodology		
A grade of B or higher is required:		
HIST 5101	Theory and Methodology 1	3
HIST 5102	Theory and Methodology 2	3
Digital History		
HIST 7370	Texts, Maps, and Networks: Readings and Methods for Digital History	3
Research Seminar		
HIST 7301 to HIST 7325		3
Electives		
Complete 21 semester hours from the following:		21
HIST 5101 to HIST 5295		
HIST 7201	European Social History 1650–1850	
HIST 7205 to HIST 7218		
HIST 7220 to HIST 7297		

Major Requirements for Concentration in Public History

Theory and Methodology		
A grade of B or higher is required:		
HIST 5101	Theory and Methodology 1	3
Public History		
HIST 5237	Issues and Methods in Public History	3
Digital History		
HIST 7370	Texts, Maps, and Networks: Readings and Methods for Digital History	3
Fieldwork		
HIST 8410	Fieldwork in History 1	3
Research Seminar		
HIST 7301 to HIST 7325		3
Electives		
Group 1		
Complete 9 semester hours from the following:		9
HIST 5238 to HIST 5248		

HIST 7250	Topics in Public History	
Group 2		
Complete 9 semester hours from the following:		9
HIST 5111	Money, Markets, Commodities: Global Economic History	
HIST 5295 to HIST 6966		
HIST 7201 to HIST 7297		

Program Credit/GPA Requirements

33 total semester hours required
Minimum 3.000 GPA required

Public History, Graduate Certificate

The Graduate Certificate in Public History allows students to pursue an organized course of study in public history while completing requirements for their degrees in existing doctoral and master's programs. Students have an opportunity to gain a knowledge of core methods and issues in the field of public history and are enabled to use public history approaches in their own research and work.

Public history is a well-established field of practice that marries academic research and methods to public applications and collaborations. Public historians typically work in museums, archives, historical societies, documentary film production, and social activism, though training in public history is useful to a wide variety of humanistic, social science, and legal fields.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
HIST 5237	Issues and Methods in Public History	3
HIST 8410	Fieldwork in History 1	3
Electives		
Complete two of the following:		6
HIST 5238	Managing Nonprofit Organizations	
HIST 5239	Media and History	
HIST 5240	Historical Societies and Archives	
HIST 5241	Exhibits and Museums	
HIST 5243	Industrial Archaeology	
HIST 5244	Historic Preservation	
HIST 5245	Historical Analysis of Public Policy	
HIST 5246	Oral History	
HIST 5248	Historical Administration	
HIST 7219	Topics in Cultural History	
HIST 7240	Visual and Material Culture	
HIST 7250	Topics in Public History (Sites of Violence and Public Memory)	
HIST 7250	Topics in Public History (Public History and Slavery)	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Political Science

Website (http://www.northeastern.edu/cssh/polisci)

Thomas J. Vicino, PhD
Associate Professor and Chair
t.vicino@northeastern.edu

Graduate Program Directors

John Portz, PhD
PhD and MA Programs
j.portz@northeastern.edu

Daniel Aldrich, PhD
MS Security and Resilience Studies Program
d.aldrich@northeastern.edu

903 Renaissance Park
617.373.4404
617.373.5311 (fax)
gradpolisci@northeastern.edu

Graduate Programs Contact
Britain Scott, Graduate Program Administrator,
br.scott@northeastern.edu

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

Graduate training in political science prepares students to analyze important issues in world affairs and succeed in a wide array of careers—from government and academia to the nonprofit and private sectors. Graduate programs in political science, public policy, public administration, security and resilience studies, and international affairs at Northeastern explore the theory and practice of politics, public policy, and public management in the United States and throughout the world. In teaching and research, faculty members in the department cover a broad range of topics and issues in the field of political science. Core areas of inquiry within our department include national and international security, international public policy, U.S. public policy and administration, network science, European studies, Middle East studies, and democratization and development.

Programs

Doctor of Philosophy (PhD)

- Political Science (p. 390)
- Political Science, PhD—Advanced Entry (p. 390)

Master of Arts (MA)

- Political Science (p. 391)

Master of Public Administration (MPA)

- Public Administration (p. 393)

Master of Science (MS)

- Security and Resilience Studies (p. 394)

Graduate Certificate

- Security and Resilience Studies (p. 396)

Political Science, PhD

John Portz, PhD
Program Director
j.portz@northeastern.edu

Britain Scott
Graduate Program Administrator
617.373.4404
br.scott@northeastern.edu

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Doctor of Philosophy in Political Science is grounded in the core fields of the discipline—American government and politics, comparative politics, international relations, and public policy. Students identify a primary and secondary field as areas of emphasis. The curriculum introduces students to all four fields and also seeks to develop their research skills through a series of methods courses. Students may develop a traditional, academic focus in one of the fields, or they may combine it with public policy to highlight a policy orientation. The program focuses on preparing students to be academic scholars and teachers as well as practitioners in research and public service. The PhD degree requires completion of required courses, passing a written and oral comprehensive examination, and the successful defense of the dissertation before a faculty committee.

Credit Requirements

Students entering with a bachelor's degree must complete 48 semester hours. Students currently in the MA or MPA program and accepted into the PhD program before completing the MA or MPA must complete 48 semester hours.

Doctoral Degree Candidacy

Doctoral degree candidacy is attained after successfully completing all course work and passing written and oral comprehensive examinations.

Academic Standing/Progress

All doctoral students must maintain an overall cumulative grade-point average (GPA) of 3.500 while making progress toward the degree requirements. Students who fall below any applicable standard for two consecutive semesters are subject to dismissal from the graduate program. Additionally, receipt of financial support administered by the department, college, or university is contingent on satisfactory academic progress toward the degree and specific guidelines as published in the terms of award. Students who have ungraded courses or courses graded as incomplete risk no longer being eligible for financial aid awards.

Language Proficiency

Students who conduct research in a language other than English must demonstrate proficiency as necessary for completion of the dissertation. Language courses do not count as electives.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Comprehensive examination
Annual review
Language (as determined by committee)
PhD candidacy
Dissertation proposal
Dissertation committee
Dissertation defense

Major Requirements

Inquiry and Design		
POLS 7200	Perspectives on Social Science Inquiry	3
POLS 7201	Research Design	3
Quantitative Techniques		
Advanced methods courses from other disciplines may be chosen in consultation with your faculty advisor.		
POLS 7202	Quantitative Techniques	3
POLS 7215	Advanced Quantitative Techniques	3
or LPSC 7215	Advanced Quantitative Techniques	
Seminars		
POLS 7204	Seminar in Public Policy	3
POLS 7205	Seminar in American Government and Politics	3
POLS 7206	Seminar in Comparative Politics	3
POLS 7207	Seminar in International Relations	3

Electives

Courses from other disciplines may be chosen in consultation with your faculty advisor.

Complete 24 semester hours from the following:		24
POLS 7200 to POLS 7978		
POLS 8982	Readings	

Exam and Dissertation

Exam Preparation		
POLS 8960	Exam Preparation—Doctoral	
Dissertation		
Complete the following (repeatable) course twice:		
POLS 9990	Dissertation	
Dissertation Continuation		
Complete the following (repeatable) course until graduation:		
POLS 9996	Dissertation Continuation	

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.500 GPA required

Political Science, PhD—Advanced Entry

Program Director
John Portz, PhD, j.portz@northeastern.edu

Graduate Program Administrator
Britain Scott, br.scott@northeastern.edu
617.373.4404

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Doctor of Philosophy in Political Science is grounded in the core fields of the discipline—American government and politics, comparative politics, international relations, and public policy. Students identify a primary and secondary field as areas of emphasis. The curriculum

introduces students to all four fields and also seeks to develop their research skills through a series of methods courses. Students may develop a traditional, academic focus in one of the fields, or they may combine it with public policy to highlight a policy orientation. The program is designed to prepare students to be academic scholars and teachers as well as practitioners in research and public service. The PhD degree requires completion of required courses, passing a written and oral comprehensive examination, and the successful defense of the dissertation before a faculty committee.

Credit Requirements and Advanced Standing

Students entering with a master's degree from outside Northeastern may receive advanced standing for prior course work but must complete a minimum of 30 semester hours. Students entering with a Northeastern MA in political science must complete a minimum of 18 semester hours while also satisfying all PhD course requirements. Students entering with a Northeastern MPA degree must complete a minimum of 6 semester hours while also satisfying all PhD course requirements. Students currently in the MA or MPA program and accepted into the PhD before completing the MA or MPA must complete 48 semester hours.

Doctoral Degree Candidacy

Doctoral degree candidacy is attained after successful completion of all course work and passing written and oral comprehensive examinations.

Academic Standing/Progress

All doctoral students must maintain an overall cumulative grade-point average (GPA) of 3.500 while making progress toward the degree requirements. Students who fall below any applicable standard for two consecutive semesters are subject to dismissal from the graduate program. Additionally, receipt of financial support administered by the department, college, or university is contingent on satisfactory academic progress toward the degree and specific guidelines as published in the terms of award. Students who have ungraded courses or courses graded as incomplete risk no longer being eligible for financial aid awards.

Language Proficiency

For students who conduct research in a language other than English, he or she must demonstrate proficiency as necessary for completion of the dissertation. Language courses do not count as electives.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Comprehensive examination
Annual review
Language (as determined by committee)
PhD candidacy
Dissertation proposal
Dissertation committee
Dissertation defense

Major Requirements

Consult the graduate program director regarding which major-required courses apply to your individual plan of study.

Inquiry and Design		
POLS 7200	Perspectives on Social Science Inquiry	3
POLS 7201	Research Design	3
Quantitative Techniques		
Advanced methods courses from other disciplines may be chosen in consultation with your faculty advisor.		
POLS 7202	Quantitative Techniques	3
POLS 7215	Advanced Quantitative Techniques	3
or LPSC 7215	Advanced Quantitative Techniques	
Seminars		
POLS 7204	Seminar in Public Policy	3
POLS 7205	Seminar in American Government and Politics	3
POLS 7206	Seminar in Comparative Politics	3
POLS 7207	Seminar in International Relations	3

Electives

Courses from other disciplines may be chosen in consultation with your faculty advisor.

Complete 3–15 semester hours in the following:		3-15
POLS 7200 to POLS 7978		

Exam and Dissertation

Exam Preparation	
POLS 8960	Exam Preparation—Doctoral
Dissertation	
Complete the following (repeatable) course twice:	
POLS 9990	Dissertation
Dissertation Continuation	
Complete the following (repeatable) course until graduation:	
POLS 9996	Dissertation Continuation

Program Credit/GPA Requirements

6–30 total semester hours required
Minimum 3.500 GPA required

Political Science, MA

Program Director
John Portz, PhD, j.portz@northeastern.edu

Graduate Program Administrator
Britain Scott, br.scott@northeastern.edu
617.373.4404

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Master of Arts program focuses on the core scholarly areas of political science. Students specialize in one of five concentration areas: American government and politics, comparative government and politics, international relations, public policy, and security studies. Courses in the MA program serve as a foundation for work in a doctoral program or as preparation for careers in government, nonprofit organizations, or related work in the private sector.

To earn the Master of Arts in Political Science degree at Northeastern, you must successfully complete 30 semester hours (typically 10 courses) of credit. Full-time students can expect to complete the degree within two academic years. Course work consists of 3 semester hours in a required statistics course, 12 semester hours within a chosen concentration, 3 semester hours outside the student's area of concentration, and a

remaining 12 elective semester hours. To see the full breakdown, click the Program Requirements tab above.

Academic Standing/Progress

Satisfactory progress in the MA program includes maintaining a grade-point average (GPA) of 3.000 overall as well as in the student's concentration area. A final cumulative GPA of at least 3.000 in all course work is required to qualify for the Master of Arts degree. Any course in which a student earns lower than a C grade cannot be used to fulfill concentration area requirements. A student who fails to make satisfactory progress is placed on academic probation, which is a warning that the student may not be allowed to continue in the graduate program unless the deficiency is addressed.

Experiential Education Requirement

In addition to in-class course work, students are required to complete an experiential education component that advances their learning, research, and/or career objectives. Experiential education offers MA students a direct experience with focused reflection relevant to their academic studies. For students with research interests, the experience focuses on related activities, such as primary source analysis and data gathering. For other students, the experience involves engagement with areas of practice and policy, such as an internship. An experiential education opportunity will be satisfied with a minimum of 3 semester hours and a maximum of 6 semester hours.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Quantitative Techniques

POLS 7202	Quantitative Techniques	3

Concentrations

Complete one of the following concentrations:

- American Government (p. 392)
- International Relations (p. 392)
- Comparative Politics (p. 392)
- Public Policy (p.)
- Security Studies (p.)

Electives

Complete 15 semester hours in the following range:		15
POLS 5100 to POLS 7978		

AMERICAN GOVERNMENT CONCENTRATION

Seminar

POLS 7205	Seminar in American Government and Politics	3

American Government Courses

Complete 9 semester hours from the following:		9
POLS 7250	American Political Institutions and Processes	
POLS 7251	Congress and Policy	
POLS 7252	The American Presidency	
POLS 7253	American Constitutional History and Theory	
POLS 7254	Campaigns and Elections	
POLS 7255	American Political Parties and Elections	
POLS 7257	The U.S. Judicial Process	
POLS 7258	Interest Groups and Social Movements	
POLS 7283	Trends in American Political Thought	
PPUA 6505	Public Budgeting and Financial Management	
PPUA 6502	Economic Institutions and Analysis	
PPUA 6521	Administrative Law and Politics	
POLS 7312	Intergovernmental Relations	
POLS 7313	State Government	
POLS 7314	Urban Government and Politics	
PPUA 6530	State and Local Public Finance	
POLS 7319	Business/Government Relations	
PPUA 7240	Health Policy and Politics	
PPUA 7245	Education Policy in the United States	
POLS 7331	Environmental Policy and Politics	
POLS 7332	Gender and Politics	
POLS 7341	Security and Resilience Policy	
POLS 7361	U.S. National Security Policy	
POLS 7367	U.S. Foreign Policy	

INTERNATIONAL RELATIONS CONCENTRATION

Seminar

POLS 7207	Seminar in International Relations	3

International Relations Courses

Complete 9 semester hours from the following:		9
POLS 7325	Contemporary Issues in Third World Development	
PPUA 7243	International Development Administration and Planning	
PPUA 7244	Comparative Public Policy and Administration	
POLS 7331	Environmental Policy and Politics	
POLS 7332	Gender and Politics	
POLS 7341	Security and Resilience Policy	
POLS 7351	Democratization and Governance	
POLS 7357	International Political Economy	
POLS 7359	International Law	
POLS 7360	Ethnic Political Conflict	
POLS 7367	U.S. Foreign Policy	
POLS 7369	International Security	
POLS 7376	Government and Politics of the Middle East	
POLS 7377	Arab-Israeli Conflict	
POLS 7379	Chinese Politics and Foreign Policy	
POLS 7381	U.S.-East Asia Relations	
POLS 7382	Politics of Developing Nations	
POLS 7385	Transatlantic Relations	
POLS 7394	Topical Seminar in International Relations	

COMPARATIVE POLITICS CONCENTRATION

Seminar

POLS 7206	Seminar in Comparative Politics	3

Comparative Politics Courses

Complete 9 semester hours from the following:		9
POLS 7258	Interest Groups and Social Movements	

POLS 7325	Contemporary Issues in Third World Development
PPUA 7244	Comparative Public Policy and Administration
POLS 7332	Gender and Politics
POLS 7333	Science, Technology, and Public Policy
POLS 7351	Democratization and Governance
POLS 7352	Democratization: Basic Approaches
POLS 7353	Comparative Democracies
POLS 7354	Comparative Political Parties and Electoral Systems
POLS 7355	Comparative Constitutionalism
POLS 7356	Comparative Political Economy
POLS 7357	International Political Economy
POLS 7360	Ethnic Political Conflict
POLS 7362	Nationalism
POLS 7363	Politics of Revolution and Change
POLS 7364	Terrorism, Violence, and Politics
POLS 7365	Totalitarianism and Oppressive Government
POLS 7366	Genocide in a Comparative Perspective
POLS 7370	Europe and European Union Governance
POLS 7377	Arab-Israeli Conflict
POLS 7381	U.S.-East Asia Relations
POLS 7382	Politics of Developing Nations
POLS 7393	Topical Seminar in Comparative Politics

PUBLIC POLICY CONCENTRATION

Seminar		
POLS 7204	Seminar in Public Policy	3
Public Policy Courses		
Complete 9 semester hours from the following:		9
PPUA 6506	Techniques of Policy Analysis	
POLS 7250	American Political Institutions and Processes	
POLS 7251	Congress and Policy	
POLS 7252	The American Presidency	
POLS 7255	American Political Parties and Elections	
POLS 7283	Trends in American Political Thought	
PPUA 6507	Institutional Leadership and the Public Manager	
PPUA 6552	The Nonprofit Sector in Civil Society and Public Affairs	
PPUA 6521	Administrative Law and Politics	
PPUA 6509	Techniques of Program Evaluation	
POLS 7319	Business/Government Relations	
PPUA 7240	Health Policy and Politics	
PPUA 7239	Problems in Metropolitan Policymaking	
PPUA 7244	Comparative Public Policy and Administration	
PPUA 6524	Case Studies in Policy Analysis	
PPUA 7245	Education Policy in the United States	
POLS 7331	Environmental Policy and Politics	
POLS 7332	Gender and Politics	
POLS 7333	Science, Technology, and Public Policy	
POLS 7341	Security and Resilience Policy	
POLS 7361	U.S. National Security Policy	
POLS 7362	Nationalism	
POLS 7363	Politics of Revolution and Change	
POLS 7364	Terrorism, Violence, and Politics	
POLS 7365	Totalitarianism and Oppressive Government	
POLS 7367	U.S. Foreign Policy	
POLS 7379	Chinese Politics and Foreign Policy	
POLS 7392	Topical Seminar in Public Policy and Administration	

SECURITY STUDIES CONCENTRATION

Seminar		
POLS 7207	Seminar in International Relations	3
Security Studies Courses		
POLS 7341	Security and Resilience Policy	3
Complete 6 semester hours from the following:		6
POLS 7341	Security and Resilience Policy	
POLS 7343 to POLS 7349		
POLS 7361	U.S. National Security Policy	
POLS 7364	Terrorism, Violence, and Politics	
POLS 7369	International Security	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Public Administration, MPA

Christopher Bosso
Graduate Program Director
c.bosso@northeastern.edu
617.373.4398

Louis DaRos
Graduate Program Administrator
l.daros@northeastern.edu
617.373.5913

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Master of Public Administration (MPA) is the management and leadership degree for those seeking to serve the public good. The program seeks to equip its students with skills in policy analysis, program evaluation, research methods, and written and verbal communications. Students have an opportunity to develop competencies in budgeting and human resources, organizational management and leadership, and the interplay between ethics and accountability in a diverse society. Throughout the degree program, students gain career-oriented experience through internships, small group projects, and other interactions with professionals in the field. These experiences are designed to enable the Northeastern MPA graduate to move into a wide array of public and nonprofit sector positions at the local, state, national, and international levels.

Mission Statement

The mission of the MPA program at Northeastern University is to serve the needs of the public affairs community, including students, working

professionals, faculty, and researchers, by providing a practice-oriented and research-based graduate educational experience. The faculty pledges the best instruction available in a set of courses designed to integrate theoretical foundations with practical skills. The MPA program will prepare students to be effective in a dynamic and increasingly diverse professional environment. We also commit ourselves to assisting students in every possible way to secure internships, postgraduate employment, and overall career advancement. Students, in turn, are expected to meet high levels of academic excellence combined with ethical and professional integrity. Committed to the ideals of public service and advancing the public interest, we seek students who share the same enthusiasm.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose grade-point average (GPA) falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirement

A cumulative 3.000 GPA is required for the core requirement.

Quantitative Techniques		
LPSC 7305	Research and Statistical Methods	3
or POLS 7202	Quantitative Techniques	
Analysis		
PPUA 6506	Techniques of Policy Analysis	3
PPUA 6502	Economic Institutions and Analysis	3
Administration and Management		
PPUA 6500	Principles of Public Administration	3
PPUA 6503	Public Personnel Administration	3
PPUA 6504	Organizational Theory and Management	3
PPUA 6505	Public Budgeting and Financial Management	3
PPUA 6507	Institutional Leadership and the Public Manager	3
Capstone		
PPUA 7673	Capstone in Public Policy and Urban Affairs	3

Internship Requirement

An approved internship or waiver is required.

INTERNSHIP WAIVED

Electives		
Complete 15 semester hours from the Course List. (p. 394)		15

INTERNSHIP COMPLETED FOR COURSE CREDIT

Internship		
PPUA 6862	Internship with Research	3
Electives		
Complete 12 semester hours from the Course List. (p. 394)		12

Course List

LPSC 5000 to LPSC 7999
PPUA 5000 to PPU 7999
CRIM 5000 to CRIM 7999 (by advisement only)
ECON 5000 to ECON 7999 (by advisement only)
ENGL 5000 to ENGL 7999 (by advisement only)
HIST 5000 to HIST 7999 (by advisement only)
POLS 5000 to POLS 7999 (by advisement only)
SOCL 5000 to SOCL 7999 (by advisement only)

Program Credit/GPA Requirements

42 total semester hours required
Minimum 3.000 GPA

Security and Resilience Studies, MS

Daniel Aldrich, PhD
Graduate Program Director
d.aldrich@northeastern.edu

Britain Scott
Graduate Program Administrator
617.373.4404
br.scott@northeastern.edu

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

Security and resilience studies is an emerging field of inquiry that focuses on how global, national, and subnational actors manage a range of chronic transnational challenges—such as terrorism, organized crime, weapons proliferation, cyberattacks, bioterrorism, climate change and catastrophic disasters, migration, and radicalization—that can be destabilizing to societies. It explores how strategic doctrines, organization processes, bureaucratic behaviors, and security tools and tactics are adapting to these challenges by placing greater emphasis on resilience. Resilience is a concept rooted in multiple disciplines that is gaining widespread currency at the community, societal, and global levels given the prevalence of human-made and naturally occurring threats that do not lend themselves to preventive and protective measures. Strategies for dealing with these threats emphasize measures that mitigate, respond to, recover from, and adapt to risk in order to safeguard essential functions and societal values. Many of these measures involve the role of technologies, system design, and engineering as well as policy, regulatory, and governance issues. Students at Northeastern who enroll in the Master of Science in Security and Resilience Studies have an opportunity to become prepared to inform and support domestic and international efforts to deal with the major sources of turbulence in the 21st century.

To earn the Master of Science in Security and Resilience Studies degree at Northeastern, you must successfully complete 30 semester hours of credit. Full-time students can expect to complete the degree within one calendar year. This program can be completed either by students who are in residence at Northeastern University's Boston campus or by students who live outside the Boston area. The core courses are offered in an online or hybrid format with much of the course content available online; typically once per month, students and the professor meet in extended face-to-face sessions. Low-residency students have the option of selecting elective courses that are available in a fully online

format. Traditional students can select either traditional classroom-based courses or online courses to meet their 15 elective credits.

Academic Standing/Progress

Satisfactory progress in the MS program includes maintaining a minimum grade-point average of 3.000.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Required Core Courses

POLS 7341	Security and Resilience Policy [1]	3

Core Elective Courses

Complete 6 semester hours from the following:		6
CRIM 7200	Criminology	
POLS 7343	Counterterrorism [1]	
POLS 7346	Resilient Cities [1]	
or PPUA 7346	Resilient Cities	
POLS 7369	International Security [1]	
POLS 7441	Cyberconflict in the International System [1]	
PPUA 5390	Special Topics in Public Policy and Urban Affairs	

Research Methods

Complete 3 semester hours from the following:		3
CRIM 7404	Research Methods and Statistics	
INSH 6300	Research Methods in the Social Sciences	
POLS 7201	Research Design	
PPUA 6205	Research Design and Methodology in Urban and Regional Policy	
SOCL 7211	Research Methods	

Capstone Options

Choose one of the following options in consultation with faculty advisor and program director.

Capstone

POLS 7980	Capstone Project	3-6
or		
INSH 6864 and POLS 6964	Experiential Integration and Co-op Work Experience	3-6

Elective Themes

Electives are organized to allow students to think thematically.

- Administration, Management, and Policy (p. 395)
- Counterterrorism and Conflict Studies (p. 395)
- Cybersecurity Policy (p. 395)
- Resilient Cities (p. 395)
- Criminal Justice (p.)

ADMINISTRATION, MANAGEMENT, AND POLICY

Complete 12–15 semester hours from the following:		12-15
CRIM 7202	The Criminal Justice Process	
CRIM 7230	Police and Society	
CRIM 7404	Research Methods and Statistics	
POLS 7202	Quantitative Techniques	
POLS 7387	Global Governance	
POLS 7704	Critical Infrastructure Resilience [1]	
PPUA 6502	Economic Institutions and Analysis	
PPUA 6503	Public Personnel Administration [1]	
PPUA 6504	Organizational Theory and Management [1]	
PPUA 6505	Public Budgeting and Financial Management [1]	
PPUA 6506	Techniques of Policy Analysis [1]	
PPUA 6507	Institutional Leadership and the Public Manager [1]	

COUNTERTERRORISM AND CONFLICT STUDIES

Complete 12–15 semester hours from the following:		12-15
CRIM 7201	Global Criminology	
CRIM 7242	Terrorism and International Crime	
CRIM 7264	Immigration and Crime	
POLS 7343	Counterterrorism [1]	
POLS 7344	Hard Power, Soft Power, and Smart Power	
POLS 7360	Ethnic Political Conflict	
POLS 7361	U.S. National Security Policy	
POLS 7363	Politics of Revolution and Change	
POLS 7364	Terrorism, Violence, and Politics	
POLS 7365	Totalitarianism and Oppressive Government	
POLS 7366	Genocide in a Comparative Perspective	
POLS 7369	International Security [1]	
SOCL 7231	Sociology of Prejudice and Violence	

CYBERSECURITY POLICY

Complete 12–15 semester hours from the following:		12-15
CRIM 7246	Security Management	
CRIM 7260	Topics in Criminal Justice	
IA 5001	Cyberspace Technology and Applications	
IA 5010	Foundations of Information Assurance [1]	
IA 5200	Security Risk Management and Assessment [1]	
IA 5210	Information System Forensics [1]	
IA 5240	Cyberlaw: Privacy, Ethics, and Digital Rights [1]	
IA 5250	Decision Making for Critical Infrastructure	
POLS 7441	Cyberconflict in the International System [1]	

RESILIENT CITIES

Complete 12–15 semester hours from the following:		12-15
CRIM 7200	Criminology	
CRIM 7270	Crime and Community Context	
CRIM 7312	Special Topics in Criminology and Public Policy	
CRIM 7316	Advanced Topics in Methods	

LPSC 7312	Cities, Sustainability, and Climate Change
POLS 7346	Resilient Cities [1]
or PPUA 7346	Resilient Cities
POLS 7704	Critical Infrastructure Resilience [1]
PPUA 5261	Dynamic Modeling for Environmental Decision Making
PPUA 5262	Big Data for Cities
PPUA 5263	Geographic Information Systems for Urban and Regional Policy
PPUA 5265	Urban and Regional Policy in Developing Countries
PPUA 5266	Urban Theory and Science
PPUA 6201	The 21st-Century City: Urban Opportunities and Challenges in a Global Context
PPUA 6205	Research Design and Methodology in Urban and Regional Policy
PPUA 6206	Research Toolkit for Urban and Regional Policy: Geographic Information Systems
PPUA 7237	Advanced Spatial Analysis of Urban Systems
PPUA 7238	Climate Change and Urbanization in Developing Countries

CRIMINAL JUSTICE

Complete 12–15 semester hours from the following:		12-15
CRIM 7200	Criminology	
CRIM 7201	Global Criminology	
CRIM 7202	The Criminal Justice Process	
CRIM 7260	Topics in Criminal Justice	
CRIM 7262	Evidence-Based Crime Policy	
CRIM 7312	Special Topics in Criminology and Public Policy	
CRIM 7316	Advanced Topics in Methods	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

[1] Occasional online offering

Security and Resilience Studies, Graduate Certificate

Program Director
Daniel Aldrich, PhD, d.aldrich@northeastern.edu

Graduate Program Administrator
Britain Scott, br.scott@northeastern.edu
617.373.4404

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

The goal of the Graduate Certificate in Security and Resilience Studies is to prepare students to manage contemporary transnational risks by offering them an opportunity to gain a comprehensive understanding of the principles and policies for security and resilience of critical systems. This goal is achieved by:

- Passing a core course in security and resilience policy that introduces students to a comprehensive approach to managing transnational risks
- Passing recommended foundation courses for cyberspace policy, security administration, and counterterrorism specializations that provide a broad perspective on transnational threats and the means states use to address them
- Learning how to work with others in groups and exercise leadership in teams by completing group assignments and projects

The certificate requires students to take four courses for a total of 12 semester hours. Some courses are a hybrid format with four set face-to-face experiences per semester combined with an online component. Additional face-to-face experiences may be available for Boston-based students, although students are not required to come to campus more than four times per semester. This flexible experience offers interactive online course content and activities in tandem with structured live events that include a speaker series and interactive team project sessions.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Required Courses		
POLS 7341	Security and Resilience Policy	3
POLS 7343	Counterterrorism	3
or POLS 7441	Cyberconflict in the International System	
Elective		
Complete 6 semester hours from the following:		6
POLS 7346	Resilient Cities	
POLS 7369	International Security	
POLS 7442	Homeland Security and Resilience Law and Policy	

If not taken as a required course, POLS 7343 or POLS 7441 may be taken as an elective.

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

School of Public Policy and Urban Affairs

Website (http://www.northeastern.edu/cssh/policyschool)

Matthias Ruth, PhD
Director
m.ruth@northeastern.edu

Graduate Program Directors

Alan Clayton-Matthews, PhD
PhD Program, Law and Public Policy
a.clayton-matthews@northeastern.edu

Christopher Bosso, PhD
JD/MS Program, Law and Public Policy
MPP Program, MPA Program
Certificate Program, Public Policy Analysis

c.bosso@northeastern.edu

Amílcar Antonio Barreto, JD, PhD
MA Program, International Affairs
a.barreto@northeastern.edu

Matthias Ruth, PhD
MS Program, Urban Informatics
Certificate Program, Urban Analytics
m.ruth@northeastern.edu

Gavin Shatkin, PhD
MS Program, Urban and Regional Policy
Certificate Program, Urban Studies
g.shatkin@northeastern.edu

310 Renaissance Park
617.373.8900
617.373.7905 (fax)
sppua@northeastern.edu

Graduate Programs Contacts
Louis DaRos, Administrative Assistant, l.daros@northeastern.edu
Jennifer Mocarski, Administrative Assistant,
j.mocarski@northeastern.edu

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The School of Public Policy and Urban Affairs is nationally and internationally recognized for excellence and innovation in policy-oriented education, applied research, and engagement. Our mission is to educate professional master's and doctoral students who are sought after as policy analysts, program evaluators,and leaders of nonprofit, public, private sector, and academic institutions; to create and disseminate policy-relevant knowledge and analytical methods of value to policymakers and the public; and to serve the broader community through policy analysis and technical assistance.

The school is committed to excellence in research and education on pressing and emerging policy issues of the day—public health, climate change, environmental challenges, the court and justice systems, and creating sustainable and resilient cities that provide economic opportunity for their residents. We define our approach as locally informed and internationally relevant. Our hallmark is to engage students in building the world that they would like to live in through experiential learning opportunities and applied research.

Programs

Doctor of Philosophy (PhD)

- Law and Public Policy (p. 397)
- Law and Public Policy—Advanced Entry (p. 398)

Master of Arts (MA)

- International Affairs (p. 399)

Master of Public Administration (MPA)

- Public Administration (p. 393)

Master of Public Policy (MPP)

- Public Policy (p. 402)

Master of Science (MS)

- Urban Informatics (p. 403) (STEM Program)
- Urban and Regional Policy (p. 403)

Dual Degree

- Law and Public Policy, JD/MS (p. 406)

Graduate Certificates

- Public Policy Analysis (p. 404)
- Nonprofit Sector, Philanthropy, and Social Change (p. 405)
- Urban Analytics
- Urban Studies (p. 406)

Law and Public Policy, PhD

Website (https://www.northeastern.edu/cssh/policyschool/law-public-policy-phd)

Alan Clayton-Matthews, PhD
Graduate Program Director
a.clayton-matthews@northeastern.edu (a.clayton-matthews@northeastern.edu)
310 Renaissance Park
617.373.2909

Jenn Mocarski
Graduate Program Administrator
j.mocarski@northeastern.edu
310 Renaissance Park
617.373.2891

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

This is an interdisciplinary social science program that combines several social science and legal theoretical perspectives with both quantitative and qualitative research methodologies. The wide-ranging faculty in the School of Public Policy and Urban Affairs can support students' research and dissertations in many fields—urban policy and regional economic development; sustainability and climate change; health policy; crime, social justice, and inequality; and the intersection of law and policy. Students work with faculty members to formulate a plan of study within their field of concentration by choosing courses from graduate programs offered in the policy school, the College of Social Sciences and Humanities, and in other colleges and schools at Northeastern University. Students also study a common body of knowledge developed in core courses on policy, research methods, and law. The school's research centers and faculty members' research projects provide opportunities for students to develop insight, experience, and synergies to help with their own research goals. The college and school offer a high level of support allowing all students to be devoted full-time to their studies and research.

Doctoral Degree Candidacy

Complete all required course work with a minimum 3.500 grade-point average (GPA) in the core courses and pass the comprehensive examinations. Students entering with a bachelor's degree must complete 42 semester hours.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Comprehensive examination
Seminars

Annual review
PhD candidacy
Dissertation committee
Dissertation proposal
Dissertation defense

Major Requirements

Research and Statistical Methods		
A grade of B+ or higher is required:		
LPSC 7305	Research and Statistical Methods	3
or POLS 7202	Quantitative Techniques	
Economics		
ECON 7270	Economics of Law and Regulation	4
Policy Course		
A grade of B+ or higher is required:		
LPSC 7311	Strategizing Public Policy	3
Research Design		
A grade of B+ or higher is required:		
LPSC 7310	Research Design and Analysis	3
or PPUA 6205	Research Design and Methodology in Urban and Regional Policy	

Electives

General Electives		
Complete 6 semester hours from the following:		6
LPSC 6313	Economic Analysis for Law, Policy, and Planning	
PPUA 6201	The 21st-Century City: Urban Opportunities and Challenges in a Global Context	
PPUA 6506	Techniques of Policy Analysis	
PPUA 6509	Techniques of Program Evaluation	
PPUA 6525	Institutions and Public Policy	
Public Policy Elective		
Complete 3 semester hours of PPUA 6000-series (or higher) course or any 6000-series (or higher) course or LPSC 7976 Directed Study with program approval.		3
Methodology Elective		
Complete 3 semester hours from the following:		3
LPSC 7215	Advanced Quantitative Techniques	
CRIM 7316	Advanced Topics in Methods	
PHTH 6320	Qualitative Methods in Health and Illness	
Any 6000-series (or higher) course or LPSC 7976 Directed Study with program approval		
Law Elective		
Complete 2 semester hours of LW course work.		2
Economics Elective		
Complete 3 semester hours of ECON 6000-series (or higher) course or any 6000-series (or higher) course or LPSC 7976 Directed Study with program approval.		3
Open Electives		
Complete 12 semester hours of 6000-series (or higher) courses in subject area PPUA or any 6000-series (or higher) courses or LPSC 7976 Directed Study with program approval.		12

Exam and Dissertation

Exam Prep	
LPSC 8960	Exam Preparation—Doctoral
Dissertation	
Complete the following (repeatable) course twice:	
LPSC 9990	Dissertation

Program Credit/GPA Requirements

42 total semester hours required
Minimum 3.500 GPA required

Law and Public Policy, PhD—Advanced Entry

Website (https://www.northeastern.edu/cssh/policyschool/law-public-policy-phd)

Alan Clayton-Matthews, PhD
Graduate Program Director
a.clayton-matthews@northeastern.edu (a.clayton-matthews@northeastern.edu)
310 Renaissance Park
617.373.2909

Jenn Mocarski (j.mocarski@northeastern.edu)
Graduate Program Administrator
j.mocarski@northeastern.edu (j.mocarski@northeastern.edu)
310 Renaissance Park
617.373.2891

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

This is an interdisciplinary social science program that combines several social science and legal theoretical perspectives with both quantitative and qualitative research methodologies. The wide-ranging faculty in the School of Public Policy and Urban Affairs can support students' research and dissertations in many fields—urban policy and regional economic development; sustainability and climate change; health policy; crime, social justice, and inequality; and the intersection of law and policy. Students work with faculty members to formulate a plan of study within their field of concentration by choosing courses from graduate programs offered in the policy school, the College of Social Sciences and Humanities, and in other colleges and schools at Northeastern University. Students also study a common body of knowledge developed in core courses on policy, research methods, and law. The school's research centers and faculty members' research projects provide opportunities for students to develop insight, experience, and synergies to help with their own research goals. The college and school offer a high level of support allowing all students to be devoted full-time to their studies and research.

Doctoral Degree Candidacy

Complete all required course work with a minimum 3.500 grade-point average (GPA) in the core courses and pass the comprehensive examinations. Students entering with a JD or master's degree must complete 36 semester hours.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Comprehensive examination
Seminars

Annual review
PhD candidacy
Dissertation committee
Dissertation proposal
Dissertation defense

Major Requirements

Research and Statistical Methods		
A grade of B+ or higher is required:		
LPSC 7305	Research and Statistical Methods	3
or POLS 7202	Quantitative Techniques	
Economics		
ECON 7270	Economics of Law and Regulation	4
Policy Course		
A grade of B+ or higher is required:		
LPSC 7311	Strategizing Public Policy	3
Research Design		
A grade of B+ or higher is required:		
LPSC 7310	Research Design and Analysis	3
or PPUA 6205	Research Design and Methodology in Urban and Regional Policy	

Electives

Public Policy Elective		
Complete 3 semester hours of PPUA 6000-series (or higher) course or any 6000-series (or higher) course or LPSC 7976 Directed Study with program approval.		3
Methodology Elective		
Complete 3 semester hours from the following:		3
LPSC 7215	Advanced Quantitative Techniques	
CRIM 7316	Advanced Topics in Methods	
PHTH 6320	Qualitative Methods in Health and Illness	
Any 6000-series (or higher) course or LPSC 7976 Directed Study with program approval		
Law Elective		
Complete 2 semester hours of LW course work.		2
Economics Elective		
Complete 3 semester hours of ECON 6000-series (or higher) course or any 6000-series (or higher) course or LPSC 7976 Directed Study with program approval.		3
Open Electives		
Complete 12 semester hours of 6000-series (or higher) courses in subject area PPUA or any 6000-series (or higher) courses or LPSC 7976 Directed Study with program approval.		12

Exam and Dissertation

Exam Prep		
LPSC 8960	Exam Preparation—Doctoral	
Dissertation		
Complete the following (repeatable) course twice:		
LPSC 9990	Dissertation	

Program Credit/GPA Requirements

36 total semester hours required
Minimum 3.500 GPA required

International Affairs, MA

Amilcar Barreto, PhD
Graduate Program Director
a.barreto@northeastern.edu
201 Renaissance Park
617.373.2783

Jenn Mocarski
Graduate Program Administrator
j.mocarski@northeastern.edu (j.mocarski@northeastern.edu)
310 Renaissance Park
617.373.2891

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

We live in an increasingly interconnected global environment where people, goods, ideas, and conflicts traverse borders with rising frequency. Leaders in the activist, policy, and academic spheres must learn not only how to critically analyze these phenomena but also to envisage harnessing their constructive potential. The Master of Arts in International Affairs is an interdisciplinary graduate program dedicated to preparing tomorrow's global citizens.

A holistic approach to enhancing our understanding of the world must span the limits of any one academic field and embrace cross-disciplinary analytical competencies. Spanning several social sciences and humanities, our courses are taught by leading scholars who research democratization, gender, globalization, ethnic conflict and cooperation, human rights and international law, international relations, social activism, social justice, and many other topics. Through its core courses, its two tracks—globalization, development, and social justice; and international public policy—as well as global and regional electives, this graduate program allows students to pursue a variety of themes.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose grade-point average (GPA) falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Political Economy		
INTL 5200	Political Economy: Interdisciplinary Perspectives	3
Social Science Methods		
Complete 3 semester hours from the following:		3
ECON 5110	Microeconomic Theory	
ECON 5120	Macroeconomic Theory	
ECON 7251	International Finance	
LPSC 7305	Research and Statistical Methods	
POLS 7201	Research Design	
POLS 7202	Quantitative Techniques	
SOCL 7210	Statistical Methods of Sociology	
SOCL 7211	Research Methods	

SOCL 7220	Seminar in Qualitative Analysis

Public Policy

Complete 3 semester hours from the following: 3

PPUA 6502	Economic Institutions and Analysis
PPUA 6506	Techniques of Policy Analysis
PPUA 6507	Institutional Leadership and the Public Manager
PPUA 6509	Techniques of Program Evaluation
PPUA 6551	Nonprofit Organizations and Social Change
PPUA 6553	Nonprofit Financial Resource Development

Tracks

Complete one of the following tracks:

- International Public Policy (p. 400)
- Globalization, Development, and Social Justice (p. 401)

Required Electives

Global Issues Elective

Complete 3 semester hours from the following: 3

CRIM 7201	Global Criminology
CRIM 7336	Globalization of Crime and Justice
HIST 7237	Legal History around the World
HIST 7239	Space and Place
HIST 7316	Research Seminar in Global Environmental History
PHIL 5003	Ethics, Justice, and Global Climate Change
POLS 7362	Nationalism
POLS 7366	Genocide in a Comparative Perspective
PPUA 5260	Ecological Economics
PPUA 5265	Urban and Regional Policy in Developing Countries
PPUA 7238	Climate Change and Urbanization in Developing Countries
PPUA 7243	International Development Administration and Planning
SOCL 7230	Political Ecology of Global Capitalism

Regional Elective

Complete 3 semester hours from the following: 3

HIST 7227	20th-Century China: Revolutionary Change in a Global Context
HIST 7238	Colonialism in Contemporary Africa
HIST 7252	Topics in Middle Eastern History
POLS 7370	Europe and European Union Governance
POLS 7376	Government and Politics of the Middle East
POLS 7379	Chinese Politics and Foreign Policy
POLS 7383	Government and Politics of Latin America
POLS 7384	Government and Politics of Africa
POLS 7385	Transatlantic Relations

Open Electives [1]

Complete 12 semester hours from the following: 12

CRIM 7201	Global Criminology
CRIM 7336	Globalization of Crime and Justice
HIST 7227	20th-Century China: Revolutionary Change in a Global Context
HIST 7237	Legal History around the World
HIST 7238	Colonialism in Contemporary Africa
HIST 7239	Space and Place
HIST 7252	Topics in Middle Eastern History
HIST 7316	Research Seminar in Global Environmental History
HIST 7323	Seminar: Modern Colonialism
PHIL 5001	Global Justice
PHIL 5003	Ethics, Justice, and Global Climate Change
POLS 7325	Contemporary Issues in Third World Development
POLS 7351	Democratization and Governance
POLS 7362	Nationalism
POLS 7366	Genocide in a Comparative Perspective
POLS 7370	Europe and European Union Governance
POLS 7376	Government and Politics of the Middle East
POLS 7379	Chinese Politics and Foreign Policy
POLS 7383	Government and Politics of Latin America
POLS 7384	Government and Politics of Africa
POLS 7385	Transatlantic Relations
PPUA 5260	Ecological Economics
PPUA 5263	Geographic Information Systems for Urban and Regional Policy
PPUA 5265	Urban and Regional Policy in Developing Countries
PPUA 6407	Internship in Public Policy and Urban Affairs
PPUA 6966	Practicum
PPUA 7238	Climate Change and Urbanization in Developing Countries
PPUA 7243	International Development Administration and Planning
PPUA 7976	Directed Study
SOCL 7100	Queer Theory: Sexualities, Genders, Politics
SOCL 7221	Globalization, Development, and Social Justice
SOCL 7222	Gender and Globalization
SOCL 7225	Gender and Social Movements
SOCL 7268	Globalization and the City
SOCL 7230	Political Ecology of Global Capitalism

[1] Electives may also be chosen from any other track or elective category. Six of the twelve credits may be fulfilled by a thesis.

INTERNATIONAL PUBLIC POLICY TRACK

Global Governance

POLS 7387	Global Governance	3

International Public Policy Electives		
Complete 6 semester hours from the following:		6
CRIM 7242	Terrorism and International Crime	
POLS 7207	Seminar in International Relations	
POLS 7282	Contemporary Political Thought	
POLS 7333	Science, Technology, and Public Policy	
POLS 7351	Democratization and Governance	
POLS 7356	Comparative Political Economy	
POLS 7357	International Political Economy	
POLS 7359	International Law	
POLS 7369	International Security	
PPUA 7244	Comparative Public Policy and Administration	

GLOBALIZATION, DEVELOPMENT, AND SOCIAL JUSTICE TRACK

Globalization, Development, and Social Justice		
SOCL 7221	Globalization, Development, and Social Justice	3

Globalization, Development, and Social Justice Electives		
Complete 6 semester hours from the following:		6
HIST 7323	Seminar: Modern Colonialism	
PHIL 5001	Global Justice	
POLS 7325	Contemporary Issues in Third World Development	
POLS 7351	Democratization and Governance	
SOCL 7100	Queer Theory: Sexualities, Genders, Politics	
SOCL 7222	Gender and Globalization	
SOCL 7225	Gender and Social Movements	
SOCL 7268	Globalization and the City	

Program Credit/GPA Requirements

36 total semester hours required
Minimum 3.000 GPA required

Public Administration, MPA

Christopher Bosso
Graduate Program Director
c.bosso@northeastern.edu
617.373.4398

Louis DaRos
Graduate Program Administrator
l.daros@northeastern.edu
617.373.5913

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Master of Public Administration (MPA) is the management and leadership degree for those seeking to serve the public good. The program seeks to equip its students with skills in policy analysis, program evaluation, research methods, and written and verbal communications. Students have an opportunity to develop competencies in budgeting and human resources, organizational management and leadership, and the interplay between ethics and accountability in a diverse society. Throughout the degree program, students gain career-oriented experience through internships, small group projects, and other interactions with professionals in the field. These experiences are designed to enable the Northeastern MPA graduate to move into a wide array of public and nonprofit sector positions at the local, state, national, and international levels.

Mission Statement

The mission of the MPA program at Northeastern University is to serve the needs of the public affairs community, including students, working professionals, faculty, and researchers, by providing a practice-oriented and research-based graduate educational experience. The faculty pledges the best instruction available in a set of courses designed to integrate theoretical foundations with practical skills. The MPA program will prepare students to be effective in a dynamic and increasingly diverse professional environment. We also commit ourselves to assisting students in every possible way to secure internships, postgraduate employment, and overall career advancement. Students, in turn, are expected to meet high levels of academic excellence combined with ethical and professional integrity. Committed to the ideals of public service and advancing the public interest, we seek students who share the same enthusiasm.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose grade-point average (GPA) falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirement

A cumulative 3.000 GPA is required for the core requirement.

Quantitative Techniques		
LPSC 7305 or POLS 7202	Research and Statistical Methods Quantitative Techniques	3
Analysis		
PPUA 6506	Techniques of Policy Analysis	3
PPUA 6502	Economic Institutions and Analysis	3
Administration and Management		
PPUA 6500	Principles of Public Administration	3
PPUA 6503	Public Personnel Administration	3
PPUA 6504	Organizational Theory and Management	3
PPUA 6505	Public Budgeting and Financial Management	3
PPUA 6507	Institutional Leadership and the Public Manager	3
Capstone		
PPUA 7673	Capstone in Public Policy and Urban Affairs	3

Internship Requirement

An approved internship or waiver is required.

INTERNSHIP WAIVED

Electives		
Complete 15 semester hours from the Course List. (p. 394)		15

INTERNSHIP COMPLETED FOR COURSE CREDIT

Internship		
PPUA 6862	Internship with Research	3
Electives		
Complete 12 semester hours from the Course List. (p. 394)		12

Course List

LPSC 5000 to LPSC 7999
PPUA 5000 to PPU 7999
CRIM 5000 to CRIM 7999 (by advisement only)
ECON 5000 to ECON 7999 (by advisement only)
ENGL 5000 to ENGL 7999 (by advisement only)
HIST 5000 to HIST 7999 (by advisement only)
POLS 5000 to POLS 7999 (by advisement only)
SOCL 5000 to SOCL 7999 (by advisement only)

Program Credit/GPA Requirements

42 total semester hours required
Minimum 3.000 GPA

Public Policy, MPP

Christopher Bosso, PhD
Graduate Program Director
c.bosso@northeastern.edu
310 Renaissance Park
617.373.4398

Jenn Mocarski
Graduate Program Administrator
j.mocarski@northeastern.edu
310 Renaissance Park
617.373.2891

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/gradaute/current_students)

The Master of Public Policy (MPP) is the recognized industry standard for those seeking careers in public policy analysis and design. As such, a typical MPP degree emphasizes the analysis of data and other relevant information to enable graduates to assess public problems, develop appropriate policy responses, and evaluate program effectiveness. MPP graduates enter careers as policy analysts, researchers, consultants, program evaluators, and policymakers in a broad range of public and nonprofit settings, ranging from the local to the international, and in the private sector. At Northeastern, the MPP joins our long-established and nationally accredited Master of Public Administration (MPA) as well as our Master of Science in Urban and Regional Policy (MURP), Urban Informatics, and International Affairs. As such, MPP students will be part of a larger School of Public Policy and Urban Affairs community of great intellectual and policy area diversity.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose grade-point average (GPA) falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Methods, Statistics, and Applications Core		
LPSC 7305	Research and Statistical Methods	3
or POLS 7202	Quantitative Techniques	
PPUA 6205	Research Design and Methodology in Urban and Regional Policy	3
PPUA 6509	Techniques of Program Evaluation	3
Policy Frameworks and Practice Core		
LPSC 6313	Economic Analysis for Law, Policy, and Planning	3
LPSC 7311	Strategizing Public Policy	3
PPUA 6506	Techniques of Policy Analysis	3
PPUA 6525	Institutions and Public Policy	3
PPUA 7673	Capstone in Public Policy and Urban Affairs	3
Methods and Statistics Elective		
Complete 3 semester hours from the following:		3
LPSC 7215	Advanced Quantitative Techniques	
POLS 7216	Applied Cases in Advanced Quantitative Methodology	
PPUA 5261	Dynamic Modeling for Environmental Decision Making	
PPUA 5262	Big Data for Cities	
PPUA 5263	Geographic Information Systems for Urban and Regional Policy	

Internship Requirement

An approved internship or waiver is required.

INTERNSHIP WAIVED

Electives		
Complete 12 semester hours from the Course List. (p. 402)		12

INTERNSHIP COMPLETED NOT FOR COURSE CREDIT

Internship		
PPUA 6861	Internship	0
Electives		
Complete 12 semester hours from the Course List. (p. 402)		12

INTERNSHIP COMPLETED FOR COURSE CREDIT

Internship		
PPUA 6862	Internship with Research	3
Electives		
Complete 9 semester hours from the Course List. (p. 402)		9

Specialization

No specialization is required. If you wish to pursue a specialization, please consult the program director. Specializations can include policy analysis and statistics, sustainability and climate change, urban informatics, law and policy, health policy, security and resilience.

Course List

PPUA 5000 to PPUA 7999
LPSC 5000 to LPSC 7999

CRIM 5000 to CRIM 7999 (by advisement only)	
ECON 5000 to ECON 7999 (by advisement only)	
ENGL 5000 to 7999 (by advisement only)	
HIST 5000 to HIST 7999 (by advisement only)	
POLS 5000 to POLS 7999 (by advisement only)	
SOCL 5000 to SOCL 7999 (by advisement only)	

Program Credit/GPA Requirements

39 total semester hours required
Minimum 3.000 GPA required

Urban Informatics, MS

Matthias Ruth, PhD
Graduate Program Director
m.ruth@northeastern.edu

Louis DaRos
Graduate Program Administrator
617.373.5913
l.daros@northeastern.edu

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The STEM-designated Master of Science in Urban Informatics (MSUI) degree couples comprehensive data analytics skills with an understanding of the big questions faced by cities in the 21st-century city. This cutting-edge program is built upon a unique cross-college initiative, which offers comprehensive state-of-the-art training in the core skills of data analytics—including quantitative analysis, data mining, machine learning, and data visualization. Urban informatics students supplement training in these foundational skills with a specialized sequence of courses that address how data and technology are being used to tackle key social, infrastructural, and environmental challenges.

By combining a theoretically informed perspective of cities with advanced skills in accessing, managing, analyzing, and communicating insights from large complex, data sets, graduates are a part of the next wave of urban professionals ready to lead in the public, private, and nonprofit sectors. Given the continuous growth in urban data and technology, these professionals are essential to shaping the future of urban areas around the globe.

This program provides a uniquely integrated urban and informatics degree with a substantial experiential education component. The focus throughout is on practical application, and students have multiple opportunities to apply what they are learning.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose grade-point average (GPA) falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Data Science Courses		
DA 5020	Collecting, Storing, and Retrieving Data	4
DA 5030	Introduction to Data Mining/Machine Learning	4
PPUA 5301	Introduction to Computational Statistics	4
PPUA 5302	Information Design and Visual Analytics	4
Methods and Applications		
PPUA 5262	Big Data for Cities	3
PPUA 5263	Geographic Information Systems for Urban and Regional Policy	3
PPUA 5266	Urban Theory and Science	3
Analysis		
PPUA 7237	Advanced Spatial Analysis of Urban Systems	3
or PPUA 5261	Dynamic Modeling for Environmental Decision Making	
Research or Capstone		
PPUA 6966	Practicum	3
or PPUA 7673	Capstone in Public Policy and Urban Affairs	
Portfolio		
PPUA 6410	Urban Informatics Portfolio	1

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Urban and Regional Policy, MS

Gavin Shatkin, PhD
Graduate Program Director
g.shatkin@northeastern.edu (g.shatkin@northeastern.edu)
310 Renaissance Park
617.373.3074

Jenn Mocarski
Graduate Program Administrator
j.mocarski@northeastern.edu
310 Renaissance Park
617.373.2891

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

The Master of Science in Urban and Regional Policy (MURP) seeks to equip students with the skills to solve today's critical urban problems through the use of policy analysis, research, and strategic action. Many of the major issues that societies face today—issues of climate change and sustainability, equity and social justice, and economic growth—have their roots in urban growth and change. Solutions to these issues require a multisystem approach that coordinates interventions in economic, environmental, sociocultural, political, spatial, and infrastructural systems in order to maximize impact. For example, revitalizing a distressed community requires connecting it to economic opportunity through transportation and economic development interventions, providing good-quality affordable housing, fostering social interaction through the creation of public space, encouraging the development of strong social institutions, and dealing with environmental concerns.

The MURP degree marries training in theories and frameworks of urban development with an understanding of urban politics and the way in which different policy strategies evolve through the interplay between

branches and levels of government. Students have an opportunity to learn skills of policy analysis, economic analysis, quantitative and qualitative research, and oral and written communication. Moreover, students have opportunities to gain experience in the application of their knowledge and skills through internships, class projects, and a capstone research report. Students graduate and enter the workforce with a unique set of perspectives, skills, experiences, and professional connections. Many go on to careers working for state and local government, federal agencies, community development corporations and other nonprofit organizations, research institutes, and as private-sector policy consultants.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Quantitative Techniques		
LPSC 7305	Research and Statistical Methods	3
or POLS 7202	Quantitative Techniques	
Policy		
LPSC 6313	Economic Analysis for Law, Policy, and Planning	3
LPSC 7311	Strategizing Public Policy	3
PPUA 6204	Urban Development and Politics	3
PPUA 6201	The 21st-Century City: Urban Opportunities and Challenges in a Global Context	3
Evaluation and Research		
PPUA 6509	Techniques of Program Evaluation	3
PPUA 6205	Research Design and Methodology in Urban and Regional Policy	3
Research Toolkits		
Complete 3 semester hours from the following:		3
PPUA 6206 to PPUA 6214		
PPUA 6216	Research Toolkit for Urban and Regional Policy: Grant Writing	
Capstone		
PPUA 7673	Capstone in Public Policy and Urban Affairs	3

Internship Requirement

An approved internship or waiver is required.

INTERNSHIP WAIVED

Electives		
Complete 15 semester hours from the Course List.		15

INTERNSHIP COMPLETED NOT FOR COURSE CREDIT

Internship		
PPUA 6861	Internship	0
Electives		
Complete 15 semester hours from the Course List.		15

INTERNSHIP COMPLETED FOR COURSE CREDIT

Internship		
PPUA 6862	Internship with Research	3
Electives		
Complete 12 semester hours from the Course List.		12

Course List

LPSC 5000 to LPSC 7999
PPUA 5000 to PPU 7999
CRIM 5000 to CRIM 7999 (by advisement only)
ECON 5000 to ECON 7999 (by advisement only)
ENGL 5000 to ENGL 7999 (by advisement only)
HIST 5000 to HIST 7999 (by advisement only)
POLS 5000 to POLS 7999 (by advisement only)
SOCL 5000 to SOCL 7999 (by advisement only)

Program Credit/GPA Requirements

42 total semester hours required
Minimum 3.000 GPA required

Public Policy Analysis, Graduate Certificate

Graduate Program Director
Christopher Bosso, PhD, c.bosso@northeastern.edu

Graduate Program Administrator
Jennifer Mocarski, j.mocarski@northeastern.edu

CSSH Graduate General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Graduate Certificate in Public Policy Analysis seeks to provide current Northeastern students in a variety of graduate programs outside of the Master of Public Policy program with the tools necessary to analyze and to shape public policy at the local, state, and national levels. Students have an opportunity to gain an understanding of the political and legal processes of policymaking, develop skills central to conducting research on policy questions, and learn techniques for evaluating the effectiveness of competing policies.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose grade-point average (GPA) falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

General Requirements

Policy		
LPSC 6313	Economic Analysis for Law, Policy, and Planning	3
or PPUA 6502	Economic Institutions and Analysis	
LPSC 7311	Strategizing Public Policy	3
or PPUA 6506	Techniques of Policy Analysis	
Methodology and Evaluation		
LPSC 7305	Research and Statistical Methods	3
or POLS 7202	Quantitative Techniques	
PPUA 6509	Techniques of Program Evaluation	3
or PPUA 6205	Research Design and Methodology in Urban and Regional Policy	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Nonprofit Sector, Philanthropy, and Social Change, Graduate Certificate

Louis DaRos
Graduate Program Administrator
l.daros@northeastern.edu

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Graduate Certificate in Nonprofit Sector, Philanthropy, and Social Change is a response to recent developments in social change theory, practice, and funding that are placing new demands and expectations on social change actors in the nonprofit, public, and private sectors, including nonprofit leaders, philanthropists, policymakers, and corporate social responsibility managers. These developments include the emergence of hybrid, cross-sector business models and new intermediary mechanisms for channeling the flow of capital into social change; new expectations and standards for performance measurement, transparency, and accountability; more sophisticated use of data and technology to support decision making, evaluation, and continual improvement; decreased public funding for traditional nonprofit activities; and the emergence of social media as a vehicle for mobilizing people and resources. The certificate enables social change professionals in all sectors to respond to these changes more effectively and will distinguish itself from other nonprofit certificate programs by focusing on the relationship between social program implementation and funding.

The certificate is a professionally oriented, application-based program for students seeking leadership positions in nonprofit organizations or in a public agency that deals extensively with nonprofits. The curriculum is designed to address the distinctive features and practices of the nonprofit sector and emphasizes management techniques helpful to nonprofit leaders.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose GPA falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Required Courses		
PPUA 6551	Nonprofit Organizations and Social Change	3
PPUA 6552	The Nonprofit Sector in Civil Society and Public Affairs	3
Electives		
Complete 6 semester hours from the following. Courses outside this list may be taken as electives with approval of the Graduate Program Director.		6
PPUA 5275	Philanthropy and Civil Society	
PPUA 6509	Techniques of Program Evaluation	
PPUA 6522	Administrative Ethics and Public Management	
PPUA 6523	Accountability, Performance Measurement, and Contracting in the Public Sector	
PPUA 6553	Nonprofit Financial Resource Development	
PPUA 6554	International NGOs and Transnational Activism	
PPUA 6966	Practicum	
PPUA 7243	International Development Administration and Planning	
PPUA 7976	Directed Study	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Urban Analytics, Graduate Certificate

Matthias Ruth, PhD
Graduate Program Director
m.ruth@northeastern.edu

Louis DaRos
Graduate Program Administrator
l.daros@northeastern.edu

CSSH Graduate General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

With 75 percent of the world's population projected to be living in cities by 2050, the need for professionals in urban planning and related careers will only increase. The Graduate Certificate in Urban Analytics seeks to prepare students outside of the Master of Science in Urban Informatics program to manage the progressively complex issues involved with rapidly expanding data and technological resources in cities. As Claire Lane of the City of Boston recently noted, "The blueprints for great cities are increasingly anchored in big data, expressed in GIS [Geographic Information Systems] and codified in coherent policy." Successful graduates with an urban analytics certificate have skills in each of these areas, which prepares them to be professionals ready to shape the future of cities across the globe.

Students are trained with the practical and theoretical knowledge necessary to understand the intricacies of interconnected urban systems and to analyze how these systems work together to create sustainable, resilient, and just cities. The curriculum emphasizes the expertise needed to bridge emerging technological capacities and traditional policymaking processes. Students cultivate applied skills in visual presentation, analysis, and modeling of new data sets—all of which helps to inform investment and policymaking. Inspired by Northeastern's leadership in experiential education, students use Boston and cities around the world as learning labs.

ACADEMIC STANDING/PROGRESS

Students in the program are monitored for academic progress. Those students whose grade-point average (GPA) falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Methods and Applications		
PPUA 5262	Big Data for Cities	3
PPUA 5263	Geographic Information Systems for Urban and Regional Policy	3
PPUA 5266	Urban Theory and Science	3
Elective		
Complete 3 semester hours from the following:		3
PPUA 5261	Dynamic Modeling for Environmental Decision Making	
PPUA 6966	Practicum	
PPUA 7237	Advanced Spatial Analysis of Urban Systems	

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Urban Studies, Graduate Certificate

Gavin Shatkin, PhD
Graduate Program Director
g.shatkin@northeastern.edu

Jennifer Mocarski
Graduate Program Administrator
j.mocarski@northeastern.edu
617.373.2891

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Graduate Certificate in Urban Studies provides a foundation in the fundamentals of urban and regional policy theory for students outside the Master of Science in Urban and Regional Policy degree. It also allows students to pursue course work in a range of areas of concentration, including housing and community development, urban environmental sustainability, economic development, international comparative urban policy, and transportation. The certificate is not a stand-alone program but is anchored by and incorporated into participating graduate programs.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose grade-point average (GPA) falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses		
PPUA 6201	The 21st-Century City: Urban Opportunities and Challenges in a Global Context	3
PPUA 7673	Capstone in Public Policy and Urban Affairs	3
Methods and Research Elective		
Complete 3 semester hours in the following:		3
PPUA 6205	Research Design and Methodology in Urban and Regional Policy	
PPUA 6206 to PPUA 6216 (Research Toolkits)		
Elective		
Complete 3 semester hours in the following:		3
PPUA 5000 to PPUA 7999		

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Law and Public Policy, JD/MS

Christopher Bosso, PhD
Graduate Program Director
c.bosso@northeastern.edu
310 Renaissance Park
617.373.4398

Jenn Mocarski
Graduate Program Administrator
j.mocarski@northeastern.edu
310 Renaissance Park
617.373.2891

CSSH Graduate Programs General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

The JD/MS in Law and Public Policy (LPP) is a joint program with and open only to students in the Northeastern University School of Law designed to equip graduates with a unique blend of skills for navigating a complex and rapidly changing policy landscape. The program builds on students' legal training with a compelling blend of skills in applied public policy analysis, policy design, and strategic policy formation. Students also gain career-relevant experience through internships, small group capstone projects, and other interactions with professionals in the field. All are part of a learning process designed to enable the Northeastern law and public policy graduates to navigate, and to redefine, diverse policy areas.

Ideally, students apply to the joint LPP simultaneously. Those who apply and are admitted complete the MS in LPP after completing the first year in the School of Law. Applicants will also be considered once enrolled in the JD, provided the student applies for entry to the MS in LPP in the fall of year two or the fall of year three of the JD program. In these cases, permission of the School of Law is required.

Please note that the School of Public Policy and Urban Affairs offers approximately 20 MS graduate courses in the fall and spring semesters.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Law and Public Policy Requirements

Analysis and Statistical Methods		
LPSC 6313	Economic Analysis for Law, Policy, and Planning	3
LPSC 7305	Research and Statistical Methods	3
or POLS 7202	Quantitative Techniques	
Policy Courses		
LPSC 7311	Strategizing Public Policy	3
PPUA 7673	Capstone in Public Policy and Urban Affairs	3
Evaluation and Research		
PPUA 6509	Techniques of Program Evaluation	3
Complete 1 semester hour of the following:		1
PPUA 6206 to PPUA 6216 (Research Toolkits)		
Electives		
Complete 12 semester hours from the course list below.		12

Course List

LPSC 5000 to LPSC 7999
PPUA 5000 to PPU 7999
CRIM 5000 to CRIM 7999 (by advisement)
ECON 5000 to ECON 7999 (by advisement)
ENGL 5000 to ENGL 7999 (by advisement)
HIST 5000 to HIST 7999 (by advisement)
POLS 5000 to POLS 7999 (by advisement)
SOCL 5000 to SOCL 7999 (by advisement)

Law Requirements

Complete 9 semester hours from the following subject areas:	9
LW, LAW	

Program Credit/GPA Requirements

37 total semester hours required
Minimum 3.000 GPA required

Sociology

Website (http://www.northeastern.edu/cssh/socant)

Matthew Hunt, PhD
Professor and Chair

Liza Weinstein, PhD
Associate Professor and Graduate Program Director

960 Renaissance Park
617.373.2686
617.373.2688 (fax)
gradsoc@northeastern.edu

Graduate Programs Contact
Joan Collins, Graduate Program Administrator,
j.collins@northeastern.edu

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/socant/wp-content/uploads/sites/19/2014/11/GENREGS.pdf)

Uncertainty about the economy, healthcare, and the labor market. Ethnic conflicts in an era of rapid globalization. Concern for the environment. Shifting gender arrangements as work and family come into conflict. Violence in school and even in houses of worship.

Never has there been a greater need for sociological research focused on the problems and issues of our time.

The Department of Sociology and Anthropology at Northeastern University offers MA and PhD degrees in sociology within a flexible program attractive to students interested in both academic and nonacademic careers. The MA program has two tracks—one academic and one applied (in which the student substitutes an additional research methods course for one of the required courses in social theory). Students pursuing the PhD degree earn the MA degree (academic version) en route to completing the doctorate, unless they earned the MA in sociology elsewhere. The program seeks to provide students with the theoretical foundation and research skills needed to engage in a career in teaching and research, in the public sector, or in industry. Thirty-two faculty members bring a wide range of substantive interests, organized around four specialization areas: the sociology of gender; globalization; environment and health; and urban sociology. Apart from these formal areas of concentration, the department has extraordinary strengths in inequality and social movements.

Our faculty have won numerous prizes for excellence in the classroom, and many have also played leadership roles in establishing prestigious centers and interdisciplinary programs on Northeastern's campus.

The Department of Sociology and Anthropology is a founding unit of Northeastern's School of Public Policy and Urban Affairs, which is dedicated to providing advanced research opportunities in a multidisciplinary environment. The department also maintains strong ties with the Brudnick Center for the Study of Conflict and Violence; the Women's, Gender, and Sexuality Studies program; the Kitty and Michael Dukakis Center for Urban and Regional Policy; the Northeastern Environmental Justice Research Collaborative; the Social Science Environmental Health Research Institute; and the Law and Public Policy program.

Programs

Doctor of Philosophy

- Sociology (p. 407)
- Sociology—Advanced Entry (p. 409)

Master of Arts (MA)

- Sociology (p. 411)

Sociology, PhD

The PhD program is designed to attract students who wish to develop a broad base of sociological knowledge, such as would equip students to embark on academic careers in leading institutions of higher education. The PhD program boasts a wide array of curricular strengths and diverse methodological offerings, all of which draw upon the department's emphasis on the study of social inequalities along lines of race, class, and gender. Faculty expertise ranges widely from domestic U.S. concerns to issues that affect groups, regions, and societies on a global scale.

The PhD program is organized around four key areas of specialization:

- Globalization (http://www.northeastern.edu/cssh/socant/graduate/globalization)
- Urban Sociology (http://www.northeastern.edu/cssh/socant/graduate/urban-sociology)

- Sociology of Gender (http://www.northeastern.edu/cssh/socant/graduate/sociology-of-gender)
- Environment and Health (http://www.northeastern.edu/cssh/socant/graduate/environment-and-health)

In addition to the graduate courses offered in the areas of specialization, the program offers a strong foundation in both theory (classical and contemporary) and methods (quantitative and qualitative). Reflecting the program's distinctive emphasis on social inequalities, students are required to select a core elective in this field, choosing from a list of approved courses maintained by the department (e.g., Social Psychology of Stratification (SOCL 7263). As students complete their core requirements, they also work closely with individual faculty members to advance their work within one of the department's standing areas of specialization. Students also have the right to petition to construct their own areas of specialization (pending departmental approval) and have completed area examinations in a host of subfields. Among these are environmental justice, political economy of global capitalism, theoretical criminology, feminist theory, political sociology, social psychology, sociology of violence, and immigration, among many others.

The PhD program is designed to admit relatively small numbers of graduate students each year, which affords students the opportunity to forge close working relationships with the faculty. Our faculty and graduate students work together in a number of interdisciplinary research projects, programs, and centers, including the Social Science Environmental Health Research Institute (http://www.northeastern.edu/environmentalhealth); the Brudnick Center on Violence and Conflict (http://www.northeastern.edu/brudnickcenter); the Dukakis Center for Urban and Regional Policy (http://www.northeastern.edu/dukakiscenter); the (http://catalog.northeastern.edu/graduate/social-sciences-humanities/sociology/sociology-phd/Institute%20on%20Urban%20Health%20Research%20and%20Practice)Institute on Urban Health Research and Practice (http://www.northeastern.edu/iuhrp); the Environmental Justice Research Collaborative (http://www.northeastern.edu/nejrc); the Institute on Race and Justice (http://www.northeastern.edu/irj); and the Women's, Gender, and Sexuality Studies Program (http://www.dac.neu.edu/womens.studies). Many of the faculty in the Department of Sociology and Anthropology have additional interests and are affiliated with other departments on campus, including environmental studies; law and public policy; Latino, Latin American, and Caribbean studies; African-American studies; international affairs, Jewish studies; and criminal justice. Students who wish to work with faculty in other disciplines are encouraged to enlist the aid of the sociology graduate director or their advisors in contacting individual faculty members.

Admissions

Students interested in the PhD should apply directly to that program. Students admitted without a master's degree earn the MA in sociology en route to completing their PhD requirements. Please note that all applicants for the doctoral program are required to submit a writing sample that should consist of written materials that demonstrate their capacity for scholarship at the doctoral level. (Copies of several course or term papers or a copy of a master's thesis or paper are appropriate.)

Residency Requirement

The university's residence requirement can be satisfied by one year of full-time graduate work, or its equivalent, beyond the Master of Arts degree. If the student's MA degree is not in sociology, a longer period of residence is typically required. Most students should expect to spend approximately two years, or the equivalent, in full-time graduate study beyond the requirements of the master's degree.

Theory Examination

Students entering the graduate program must take a theory qualifying examination at the conclusion of their first year of study during the spring semester. The theory qualifying examination is a standard exam taken by all students in the same cohort. The exam is graded on a pass/fail basis. Students who fail the examination may take it a second time but will not be allowed to enroll for course work beyond the 30-semester-hour MA requirement or their first year of PhD residence (whichever case applies) until successfully completing the qualifying exam. Students who fail the examination on their second attempt will be asked to leave the program. In the latter case, a student may petition the graduate committee for a review of the student's record and performance in the program.

Course Requirements

As prerequisites, all doctoral candidates are expected to have completed the core methodology and theory requirements for the Master of Arts in Sociology:

- Statistical Methods of Sociology (SOCL 7210)
- Research Methods (SOCL 7211)
- Foundations of Social Theory 1 (SOCL 7200)
- Foundations of Social Theory 2 (SOCL 7201)

Doctoral candidates are also required to complete two advanced methods classes from a list of approved courses maintained by the department. Finally, doctoral students must take a course in the area of social inequality, choosing from a list of approved courses maintained by the department.

Students entering with a bachelor's degree complete 54 semester hours. Students entering with a master's degree complete a minimum of 24 semester hours beyond the master's degree.

Degree Candidacy

To enter into degree candidacy, the student must have earned a Master of Arts degree or its departmental semester-hour equivalent, passed the qualifying examination, established a graduate committee of three faculty members from the sociology department, and successfully completed the candidacy examination.

Once students complete doctoral course work, they will register for the following courses in the following sequence:

- Exam Preparation—Doctoral (SOCL 8960) The semester following completion of course work, students will register for Exam Preparation. During this semester, students should complete their first comprehensive exam. Students only register for Exam Preparation once. Even if a student is unable to complete their first comprehensive exam during this time frame, they will not register for Exam Preparation again.
- Research (SOCL 9986) The next semester, students will register for Research, during which their second comprehensive examination should be completed. Upon completion of both comprehensive examinations, students will have achieved PhD degree candidacy, be certified by the graduate school, and will have five years to complete the dissertation.
- Dissertation (SOCL 9990) Upon achieving PhD degree candidacy, students will register for two consecutive semesters of Dissertation, during which they should complete and defend their dissertation proposal.

- Dissertation Continuation (SOCL 9996) Following the successful defense of their dissertation proposal, students will register for Dissertation Continuation for their remaining semesters until the dissertation is approved by the graduate school and submitted electronically to Proquest. Students do not have to register for Dissertation Continuation during the summer unless that is when their dissertation defense occurs.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Two field comprehensive examinations
Dissertation committee
Dissertation proposal
Dissertation defense

Requirements

Core Courses		
SOCL 7200	Foundations of Social Theory 1	3
SOCL 7201	Foundations of Social Theory 2	3
SOCL 7210	Statistical Methods of Sociology	3
SOCL 7211	Research Methods	3
SOCL 7263	Social Psychology of Stratification	3
Advanced Methods		
Complete 6 semester hours from the following:		6
SOCL 7212	Feminist Methodologies	
SOCL 7213	Advanced Research Methods	
SOCL 7215	Advanced Quantitative Techniques	
or CRIM 7715	Multivariate Analysis 1	
or POLS 7215	Advanced Quantitative Techniques	
SOCL 7220	Seminar in Qualitative Analysis	
CRIM 7316	Advanced Topics in Methods	
PHTH 6320	Qualitative Methods in Health and Illness	
PPUA 6215	Geographic Information Systems for Urban and Regional Policy	
PPUA 6509	Techniques of Program Evaluation	

Electives

Complete 33 semester hours in the following subject area:		33
SOCL		

Exam and Dissertation

Exam Preparation		
SOCL 8960	Exam Preparation—Doctoral	
Research		
SOCL 9986	Research	
Dissertation		
Complete the following (repeatable) course twice:		
SOCL 9990	Dissertation	
Dissertation Continuation		
Complete the following (repeatable) course until graduation:		
SOCL 9996	Dissertation Continuation	

Program Credit/GPA Requirements

54 total semester hours required
Minimum 3.000 GPA required

Sociology, PhD—Advanced Entry

The PhD program is designed to attract students who wish to develop a broad base of sociological knowledge, such as would equip students to embark on academic careers in leading institutions of higher education. The PhD program boasts a wide array of curricular strengths and diverse methodological offerings, all of which draw upon the department's emphasis on the study of social inequalities along lines of race, class, and gender. Faculty expertise ranges widely from domestic U.S. concerns to issues that affect groups, regions, and societies on a global scale.

The PhD program is organized around four key areas of specialization.

- Globalization (http://www.northeastern.edu/cssh/socant/graduate/globalization)
- Urban Sociology (http://www.northeastern.edu/cssh/socant/graduate/urban-sociology)
- Sociology of Gender (http://www.northeastern.edu/cssh/socant/graduate/sociology-of-gender)
- Environment and Health (http://www.northeastern.edu/cssh/socant/graduate/environment-and-health)

In addition to the graduate courses offered in the areas of specialization, the program provides a strong foundation in both theory (classical and contemporary) and methods (quantitative and qualitative). Reflecting the program's distinctive emphasis on social inequalities, students are required to select a core elective in this field, choosing from a list of approved courses maintained by the department (e.g., a course on the social psychology of stratification or a seminar in social inequality). As students complete their core requirements, they also work closely with individual faculty members to advance their work within one of the department's standing areas of concentration. Students also have the right to petition to construct their own areas of specialization (pending departmental approval) and have completed area examinations in a host of subfields. Among these are environmental justice, political economy of global capitalism, theoretical criminology, feminist theory, political sociology, social psychology, sociology of violence, and immigration, among many others.

The PhD program is designed to admit relatively small numbers of graduate students each year, which affords students the opportunity to forge close working relationships with the faculty. Our faculty and graduate students work together in a number of interdisciplinary research projects, programs, and centers, including the Social Science Environmental Health Research Institute (http://www.northeastern.edu/environmentalhealth); the Brudnick Center on Violence and Conflict (http://www.northeastern.edu/brudnickcenter); the Dukakis Center for Urban and Regional Policy (http://www.northeastern.edu/dukakiscenter); the Institute on Urban Health Research and Practice (http://www.northeastern.edu/iuhrp); Environmental Justice Research Collaborative (http://www.northeastern.edu/nejrc), the Institute on Race and Justice (http://www.northeastern.edu/irj), and the Women's, Gender and Sexuality Studies Program (http://www.dac.neu.edu/womens.studies). Many of the faculty in the Department of Sociology and Anthropology have additional interests and are affiliated with other departments on campus, including environmental studies; law, policy,

and society; Latino, Latin American, and Caribbean studies; African-American studies; international affairs; Jewish studies; and criminal justice. Students who wish to work with faculty in other disciplines are encouraged to enlist the aid of the sociology graduate program director or their advisers in contacting individual faculty members.

Admissions

Students admitted with a master's degree in sociology from another institution may be exempt from taking the theory exam but may be required to do some additional course work in theory and methods. For students admitted with a master's degree in a field other than sociology, the theory exam requirement and supplementary course work requirements will be determined on a case-by-case basis. Please note that all applicants for the doctoral program are required to submit a writing sample. The writing sample should consist of written materials that demonstrate students' capacity for scholarship at the doctoral level. (Copies of several course or term papers or a copy of a master's thesis or paper are appropriate.)

Residency Requirement

The university's residence requirement can be satisfied by one year of full-time graduate work, or its equivalent, beyond the Master of Arts degree. If the student's MA degree is not in sociology, a longer period of residence is typically required. Most students should expect to spend approximately two years, or the equivalent, in full-time graduate study beyond the requirements of the master's degree.

Theory Examination

Students entering the graduate program must take a theory qualifying examination at the conclusion of their first year of study during the spring semester. The theory qualifying examination is a standard exam taken by all students in the same cohort. The exam is graded on a pass/fail basis. Students who fail the examination may take it a second time but will not be allowed to enroll for course work beyond the 30-semester-hour MA requirement or their first year of PhD residence (whichever case applies) until successfully completing the qualifying exam. Students who fail the examination on their second attempt will be asked to leave the program. In the latter case, a student may petition the graduate committee for a review of the student's record and performance in the program.

Degree Candidacy

To enter into degree candidacy, the student must have earned a Master of Arts degree or its departmental semester hour's equivalent, passed the qualifying examination, established a graduate committee of three faculty members from the sociology department, and successfully completed the candidacy examination.

Course Requirements

Students entering the PhD program from another university will be required to take the core requirements courses unless they can provide evidence of the completion of equivalent courses during their master's degree work. Credits earned for master's-level core requirements cannot be counted toward the doctorate.

- Statistical Methods of Sociology (SOCL 7210)
- Research Methods (SOCL 7211)
- Foundations of Social Theory 1 (SOCL 7200)
- Foundations of Social Theory 2 (SOCL 7201)

Doctoral candidates are also required to complete two advanced methods classes from a list of approved courses maintained by the department. Finally, doctoral students must take a course in the area of social inequality, choosing from a list of approved courses maintained by the department.

A minimum of 24 semester hours of graduate work beyond the master's degree is required.

Once students complete doctoral course work, they will register for the following courses in the following sequence:

- Exam Preparation—Doctoral (SOCL 8960) The semester following completion of course work, students will register for Exam Preparation. During this semester, students should complete their first comprehensive exam. Students only register for Exam Preparation once. Even if a student is unable to complete their first comprehensive exam during this time frame, they will not register for Exam Preparation again.
- Research (SOCL 9986) The next semester, students will register for Research, during which their second comprehensive examination should be completed. Upon completion of both comprehensive examinations, students will have achieved PhD degree candidacy, be certified by the graduate office, and will have five years to complete the dissertation.
- Dissertation (SOCL 9990) Upon achieving PhD degree candidacy, students will register for two consecutive semesters of Dissertation, during which they should complete and defend their dissertation proposal.
- Dissertation Continuation (SOCL 9996) Following the successful defense of their dissertation proposal, students will register for Dissertation Continuation for their remaining semesters until the dissertation is approved by the graduate office and submitted electronically to Proquest.

Students do not have to register for Dissertation Continuation during the summer unless that is when their dissertation defense occurs.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination or waiver
Annual review
Two field comprehensive examinations
Dissertation committee
Dissertation proposal
Dissertation defense

Requirements

Core Course		
SOCL 7263	Social Psychology of Stratification	3
Advanced Methods		
Complete 6 semester hours from the following:		6
SOCL 7212	Feminist Methodologies	
SOCL 7213	Advanced Research Methods	
SOCL 7215	Advanced Quantitative Techniques	
or CRIM 7715	Multivariate Analysis 1	
or POLS 7215	Advanced Quantitative Techniques	
SOCL 7220	Seminar in Qualitative Analysis	
CRIM 7316	Advanced Topics in Methods	
PHTH 6320	Qualitative Methods in Health and Illness	

PPUA 6215	Geographic Information Systems for Urban and Regional Policy
PPUA 6509	Techniques of Program Evaluation

Electives

Complete 15 semester hours in the following subject area:	15
SOCL	

Exam and Dissertation

Exam Preparation	
SOCL 8960	Exam Preparation—Doctoral
Research	
SOCL 9986	Research
Dissertation	
Complete the following (repeatable) course twice:	
SOCL 9990	Dissertation
Dissertation Continuation	
Complete the following (repeatable) course until graduation:	
SOCL 9996	Dissertation Continuation

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Sociology, MA

The flexible MA degree is designed to meet the needs of applicants who seek professional training in a focused area of social research that can be chosen from urban sociology, the sociology of the environment, medical sociology, and several other fields. The program encourages students to develop expertise in research design, methodological techniques (whether quantitative or qualitative), evaluation research, and other research skills that are essential to data analysis and decision making in varied organizational settings. The MA program also seeks to equip students with substantive knowledge in fields that are relevant to consulting organizations, social policy and planning contexts, and nonprofit organizations. Some proportion of MA students may elect to go on to academic PhD training, though this is not the core mission of the MA program. Thirty semester hours of academic work, completed with a B (3.000) average or better, are required for the degree. The program consists of four required and six elective courses.

Students are encouraged to fashion a program of study best suited to their interests. Those who wish to pursue careers in applied social research or policy and administrative contexts are encouraged to emphasize methodological training. Students who may wish to pursue academic careers may instead favor courses in substantive and theoretical fields. All entering students should consult with the graduate program director, who helps the student to articulate interests and plan courses but also suggests other faculty members whose areas of interest and competence intersect with those of the student and with whom the student might consult on a regular basis. A student will be assigned an advisor; students may terminate or initiate an advisor/advisee relationship at any time simply by consulting with and informing the parties concerned. The graduate program administrator should also be informed of any changes.

The MA program affords students the opportunity to forge close working relationships with the faculty. Top applicants to the MA program are eligible for tuition scholarships from the College of Social Sciences and Humanities. The two-year program culminates in a master's paper and confers a professional degree that is of immediate use in furthering the student's career.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

MA paper
Annual review

Tracks

Complete one of the following tracks:

ACADEMIC TRACK

Foundations		
A grade of B or higher is required in each foundations course.		
SOCL 7200	Foundations of Social Theory 1	3
SOCL 7201	Foundations of Social Theory 2	3
Research Methods		
SOCL 7211	Research Methods	3
Statistical Methods		
SOCL 7210	Statistical Methods of Sociology	3

APPLIED TRACK

Foundations		
A grade of B or higher is required		
SOCL 7200	Foundations of Social Theory 1	3
Research Methods		
SOCL 7211	Research Methods	3
Statistical Methods		
SOCL 7210	Statistical Methods of Sociology	3
Additional Methods class		3

Electives

Complete 18 semester hours from the following subject area:	18
SOCL	

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Interdisciplinary

Doctor of Philosophy (PhD)

- Network Science (p. 209)

Graduate Certificate

- Data Analytics (p. 106)
- Digital Humanities (p. 385)
- Women's, Gender, and Sexuality Studies (p. 414)

Network Science, PhD

David Lazer, PhD
Distinguished Professor
College of Social Sciences and Humanities and College of Computer and Information Science

Network Science Program
177 Huntington Avenue, 10th Floor
617.373.8856
617.373.5884 (fax)
Website (http://www.networkscienceinstitute.org)
networkscience@northeastern.edu

The PhD program in network science aims to enhance our understanding of networks arising from the interplay of human behavior, sociotechnical infrastructures, information diffusion, and biological agents. This is an intrinsically multidisciplinary activity, with members of the network science community representing a wide range of fields including computer science, information science, complexity, physics, sociology, communication, organizational behavior, political science, and epidemiology. This is an interdisciplinary doctoral program focused on training students in network science across several colleges—including the College of Science, the College of Computer and Information Science, the College of Social Sciences and Humanities, Bouvé College of Health Sciences, the College of Engineering, and the College of Arts, Media and Design—with several research areas, including computational sciences, information sciences, health and life sciences, social sciences, and theoretical physics. See other collaborating colleges' catalog sections for possible concentration courses.

Course work is dependent on a student's area of concentration and subject to prior approval by their faculty advisor. Required course work includes the following: three foundational courses in network science Complex Networks and Applications (PHYS 5116) ; Network Science Data (PHYS 7331); and Dynamical Processes in Complex Networks (PHYS 7335); one of two approved courses (Social Network Analysis or Network Data Mining); 12 semester hours of elective course work defined by their specific track; and two research courses with core faculty of the program. A minimum of 32 credit hours of course work is required, though the graduate program committee may recommend additional course work based on student research interests.

Satisfactory progress in the program will be ongoing and formally evaluated at the end of both the first and second years of the program. Students are expected to maintain a cumulative GPA of 3.000 or better in all course work. Students are not allowed to retake courses. A student who does not maintain the 3.000 GPA, or is not making satisfactory progress on their dissertation research, may be recommended for termination by the graduate program committee.

Each student will have one primary research advisor from the network science doctoral program faculty.

Students will be expected to select their research advisor by the end of the spring semester of their second year in the program.

The dissertation committee consists of at least four members: the dissertation advisor, one additional network science doctoral program faculty member, one member expert in the specific topic of research (can be from outside the university), and one additional tenured/tenure-track faculty member from the concentration department/conferring college. The dissertation advisor must be a full-time tenured or tenure-track member of the Northeastern University faculty. The dissertation committee must be approved by the graduate program committee and constituted no later than the end of the spring semester of the first year of the program. Students may repeat the comprehensive examination once if they are unsuccessful.

Degree Candidacy

A student is considered a PhD candidate upon completion of all required course work with a minimum cumulative GPA of 3.000, satisfactory completion of the qualification exam, and satisfactory completion of the comprehensive exam.

Qualifying Examination

The qualification exam will be an oral examination of the material during the students' course work. The exam will be an hour in length and consist of questions selected by network science faculty who comprise the qualifying examination and dissertation committee. Students will receive 50 to 80 potential questions, which they must be prepared to answer, one month before the exam. The exam will consist of a subset of these questions. The qualifying exam will be offered twice annually, in the fall and spring term. All students are required to initially sit for the exam in the fall, typically in their third year of the PhD program. Students who do not pass the qualifying exam on their first attempt are expected to retake the exam in the spring term. Students may sit for the qualifying exam no more than twice.

Students who fail to complete the qualifying examination but who have completed all the PhD program's required course work with a cumulative GPA of 3.000 or better will be awarded a terminal Master of Science in Network Science degree. Note that no students will be admitted directly into the network science program for receipt of a master's degree.

Comprehensive Examination

Students must submit a written dissertation proposal to the qualifying examination and dissertation committee. The proposal should identify relevant literature, the research problem, the research plan, and the potential impact on the field. A presentation of the proposal will be made in an open forum, and the student must successfully defend it before the qualifying examination and dissertation committee. The comprehensive exam must precede the final dissertation defense by at least one year.

Dissertation Defense

A PhD student must complete and defend a dissertation that involves original research in network science. The dissertation defense must adhere to the College of Science policies.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual review
Qualifying exam
Dissertation committee
Dissertation proposal
Dissertation defense

Core Course Work

Networks		
CS 6220	Data Mining Techniques	4
or POLS 7334	Social Networks	
PHYS 5116	Complex Networks and Applications	4
PHYS 7331	Network Science Data	4
PHYS 7335	Dynamical Processes in Complex Networks	4
Research		
Complete the following (repeatable) course twice:		
NETS 8984	Research	1-4

Specialization

Complete 12 semester hours of course work. Areas of specialization include:

COMPUTER SCIENCE

CS 6140	Machine Learning
CS 6220	Data Mining Techniques
CS 6240	Large-Scale Parallel Data Processing
CS 7800	Advanced Algorithms
NETS 7341	Network Economics

POLITICAL SCIENCE

POLS 7200	Perspectives on Social Science Inquiry
POLS 7201	Research Design
POLS 7202	Quantitative Techniques
NETS 7341	Network Economics

EPIDEMIOLOGY

PHTH 5202	Introduction to Epidemiology
PHTH 5224	Social Epidemiology
PHTH 5240	Evaluating Scientific Evidence
NETS 7341	Network Economics

ENGINEERING

EECE 7200	Linear Systems Analysis
EECE 7204	Applied Probability and Stochastic Processes
EECE 7323	Numerical Optimization Methods
EECE 7374	Fundamentals of Computer Networks
NETS 7341	Network Economics

PHYSICS

PHYS 7305	Statistical Physics
PHYS 5318	Principles of Experimental Physics
PHYS 7321	Computational Physics
PHYS 7731	Biological Physics 1

MATH

MATH 7241	Probability 1
MATH 7233	Graph Theory
MATH 7375	Topics in Topology
MATH 7733	Readings in Graph Theory
NETS 7341	Network Economics

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Data Analytics, Graduate Certificate

The interdisciplinary Graduate Certificate in Data Analytics is offered through a collaboration between the College of Computer and Information Sciences and the College of Social Sciences and Humanities. The certificate curriculum emphasizes the skills needed to bridge between emerging technological capacities and traditional policymaking processes. The program is designed to provide students with foundational knowledge in data science—including data management, machine learning, data mining, statistics, and visualizing and communicating data—that can be applied to data-driven decision making in any discipline.

For more information on the certificate, refer to the program's website (http://www.northeastern.edu/datascience).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

DA 5020	Collecting, Storing, and Retrieving Data	4
DA 5030	Introduction to Data Mining/Machine Learning	4
PPUA 5301	Introduction to Computational Statistics	4
PPUA 5302	Information Design and Visual Analytics	4

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Digital Humanities, Graduate Certificate

Elizabeth Maddock Dillon, PhD
Certificate Co-Director
e.dillon@northeastern.edu

Julia Flanders, PhD
Certificate Co-Director
j.flanders@northeastern.edu

Sarah Connell, PhD
Certificate Administrator
sa.connell@northeastern.edu

CSSH Graduate Programs General Regulations (https://www.northeastern.edu/cssh/graduate/current_students)

The Graduate Certificate in Digital Humanities allows students to pursue an organized course of study in digital humanities with the interdisciplinary faculty of the NULab for Texts, Maps, and Networks (http://www.northeastern.edu/nulab) while completing requirements for their degrees in existing Northeastern University doctoral and master's programs. *This is not a stand-alone certificate*; rather, it will be completed by students in the course of their existing program of study.

Digital humanities (DH) is an emerging field of research that is interdisciplinary in scope and collaborative in nature. The field is developing in relation to new digital technologies that have changed the objects of study, methods, and opportunities for research and teaching in existing humanities fields. Digitized texts are now read and accessed in new ways; digitized corpora of texts make possible new modes of quantitative and qualitative analysis (including "distant reading," text mining, mapping, and network analysis); born digital objects constitute new primary sources in need of humanistic theorization, approaches, and critical vocabularies; and modes of encoding, aggregating, and connecting texts enable the creation of new archival resources that are changing our understanding of the archive itself as well revealing new historical, literary, and cultural patterns.

The field is new and developing rapidly and many students are eager for training in this area—both because DH is at the cutting edge of

disciplinary work and because it offers new opportunities for employment within the academy and outside of it.

Academic Standing/Progress

Students in the program are monitored for academic progress. Those students whose GPA falls below a 3.000 are notified by and meet with the director of academic programs. They are counseled that if their GPA does not rise to a 3.000 or higher, they run the risk of not graduating and are advised on strategies for improvement.

Final Project

The student will complete a final independent DH research project located in the student's home program (such as a thesis, or a portion thereof) or participation in a collaborative DH project with substantial student participation. The final project will be overseen by the NULab faculty members teaching the NULab Project Seminar during its development; NULab workshop instructors will advise students on their projects and help students get guidance from other faculty as appropriate. Final projects will be submitted with three components: the project itself, a written project description of about 2,000 words, and a presentation to the NULab community. The DH certificate committee will formally approve all final projects.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Topics/Readings/Methods		
ENGL 7370	Topics in Digital Humanities (Introduction to Digital Humanities)	3
or HIST 7370	Texts, Maps, and Networks: Readings and Methods for Digital History	
Lab Project Seminar		
Complete the following (repeatable) course three times:		3
INSH 7910	NULab Project Seminar	
Electives [1]		
Complete 6 semester hours from the following:		6
Independent Study, Research Project, or Thesis within student's home program		
ARTG 5100	Information Design Studio 1: Principles	
ARTG 5120	Information Design Research Methods	
CS 6120	Natural Language Processing	
ENGL 7370	Topics in Digital Humanities	
ENGL 7990	Thesis (for MA students in English; requires approval by the DH certificate program director)	
HIST 7219	Topics in Cultural History	
POLS 7334	Social Networks	
PPUA 5301	Introduction to Computational Statistics	
PPUA 5302	Information Design and Visual Analytics	

Program Credit/GPA Requirements

Minimum 12 total semester hours required
Minimum 3.000 GPA required

[1] By petition, one course outside the electives list may count as an elective with approval from the instructor and the DH certificate program director.

Women's, Gender, and Sexuality Studies, Graduate Certificate

Website (https://www.northeastern.edu/cssh/wgss/graduate/certificate)

Suzanna Walters
Graduate Program Director
s.walters@northeastern.edu

Kiki Samko
Graduate Program Administrator
k.samko@neu.edu (k.samko@neu.edu)
617.373.4984

The Graduate Certificate in Women's, Gender, and Sexuality Studies (WGSS) is designed for students currently enrolled in a Northeastern University master's or doctoral program. The certificate aims to provide enhanced competency by:

- Analyzing contemporary feminist theoretical frameworks, methodologies, issues, and topics and their relation to established disciplines
- Focusing on the intersection of gender with sexuality, race, class, and other vectors of power and identity
- Broadening and enriching analytical skills in one or more disciplines while drawing on the interdisciplinary perspectives of WGSS
- Challenging the traditional separation of academic theory from political and professional practice

Prospective certificate students are advised initially to consult with the WGSS program director to develop a plan for completing the certificate.

WGSS also offers a specific path for master's of public health students to complete a graduate certificate in WGSS. MPH students are able to apply theories, concepts, and methods gained from the WGSS certificate to urban health issues. Certificate students will work with an advisor in the public health program to develop a plan for completing the certificate.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course Work		
Complete one of the following:		3
WMNS 6100	Theorizing Gender and Sexuality	
WMNS 7615	Feminist Inquiry	
WMNS 7100	Queer Theory: Sexualities, Genders, Politics	
or SOCL 7100	Queer Theory: Sexualities, Genders, Politics	
Electives		
Complete three of the following. At least one course must come from outside the student's home discipline. Any course not taken to complete the required course work may be taken as an elective. Electives outside this list may be chosen in consultation with program director.		9
CAEP 6380	Seminar in Feminist Psychology	
CRIM 7210	Gender, Crime, and Justice	

HIST 7290	Race and Gender Frontiers: U.S. Encounters with Empire
HIST 7304	Research Seminar in Gender and Society in the Modern World
SOCL 7202	Feminist Theory
SOCL 7212	Feminist Methodologies
SOCL 7222	Gender and Globalization
SOCL 7225	Gender and Social Movements
SOCL 7236	
SOCL 7237	Women, Men, and Social Change
SOCL 7242	
SOCL 7248	Race, Gender, Class: Feminist View
SOCL 7265	Sociology of Gender
SOCL 7273	Gender and Social Policy
WMNS 7635	Understanding the Pornographic and the Obscene
WMNS 7642	Gender, Race, and the Complexities of Science and Technology
WMNS 7645	Motherhood and Mothering: Theory, Discourse, Practice, and Change
WMNS 7900	Special Topics in Women's, Gender, and Sexuality Studies
WMNS 7976	Directed Study

The following courses are required for MPH students, in addition to one elective from the list above:

PHTH 5120	Race, Ethnicity, and Health in the United States
or PHTH 6204	Society, Behavior, and Health
PHTH 6910	Public Health Capstone

Program Credit/GPA Requirements

12 total semester hours required
Minimum 3.000 GPA required

Faculty

Mehdi Abedi
Assistant Teaching Professor, Mechanical and Industrial Engineering; Northeastern University, PhD

Kuzhikalail M. Abraham
Research Professor, Chemistry and Chemical Biology; Tufts University, PhD

Max Abrahms
Assistant Professor, Political Science; University of California, Los Angeles, PhD

Ali Abur
Professor, Electrical and Computer Engineering; Ohio State University, PhD

Daniel Adams
Associate Professor, Architecture; Harvard University, MArch

George G. Adams
College of Engineering Distinguished Professor, Mechanical and Industrial Engineering; University of California, Berkeley, PhD

Jeffrey Agar
Associate Professor, Chemistry and Chemical Biology and Pharmaceutical Sciences; University of Georgia, PhD

Rajesh Aggarwal
Professor, Finance; Harvard University, PhD

Ruth Aguilera
Professor, International Business and Strategy; Harvard University, PhD

Amal Ahmed
Assistant Professor, Computer and Information Science; Princeton University, PhD

Sophia Ainslie
Lecturer, Art + Design; School of the Museum of Fine Arts/Tufts University, MFA

M. Shahid Alam
Professor, Economics; University of Western Ontario (Canada), PhD

Noor E. Alam
Assistant Professor, Mechanical and Industrial Engineering; University of Alberta (Canada), PhD

Brian Albrecht
Assistant Cooperative Education Coordinator, College of Engineering; Carnegie Mellon University, MS

Len Albright
Assistant Professor, Sociology and Anthropology and Public Policy and Urban Affairs; University of Chicago, PhD

Daniel P. Aldrich
Professor, Political Science and Public Policy and Urban Affairs; Harvard University, PhD

Todd M. Alessandri
Associate Professor, International Business and Strategy; University of North Carolina, Chapel Hill, PhD

Jacques Alexis
Assistant Academic Specialist, College of Professional Studies; University of Wisconsin, Platteville, MS

Nicole N. Aljoe
Associate Professor, English; Tufts University, PhD

Michael Allshouse
Assistant Professor, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, PhD

Meryl Alper
Assistant Professor, Communication Studies; University of Southern California, PhD

Neil O. Alper
Associate Professor, Economics; University of Pittsburgh, PhD

Akram N. Alshawabkeh
George A. Snell Professor of Engineering, Civil and Environmental Engineering; Louisiana State University, PhD

Sari Altschuler
Visiting Assistant Professor, English; City University of New York, PhD

George O. Alverson
Associate Professor, Physics; University of Illinois, Urbana-Champaign, PhD

Steven Amato
Associate Teaching Professor, College of Professional Studies; Boston College, PhD

Jane Amidon
Professor, Architecture; Harvard University, MLA

Mansoor M. Amiji
University Distinguished Professor, Pharmaceutical Sciences; Purdue University, PhD

Mahshid Amirabadi
Assistant Professor, Electrical and Computer Engineering; Texas AM University, PhD

Won-Hee An
Lecturer, Music; Boston University, DMA

James S. Anderson
Lecturer, Music; Berklee College of Music, BM

Teiichi Ando
Professor, Mechanical and Industrial Engineering; Colorado School of Mines, PhD

Rae Andre
Professor, Management and Organizational Development; University of Michigan, PhD

Jonathan Andrew
Associate Cooperative Education Coordinator, College of Social Sciences and Humanities; SIT Graduate Institute, MA

Edwin C. Andrews
Associate Professor, Art + Design; Indiana University, MFA

Nasim Annabi
Assistant Professor, Chemical Engineering; University of Sydney (Australia), PhD

Daniel Archabal
Senior Academic Specialist, Accounting; University of Pittsburgh, MBA

Arnold Arluke
Professor, Sociology and Anthropology; New York University, PhD

Carmen G. Armengol
Associate Professor, Applied Psychology; Pennsylvania State University, PhD

Richard Arrowood
Associate Teaching Professor, College of Professional Studies; Massachusetts School of Law, JD

Cheryl Arruda
Assistant Cooperative Education Coordinator, College of Engineering; Northeastern University, MEd

Susan Asai
Associate Professor, Music; University of California, Los Angeles, PhD

Lori Ashline
Assistant Teaching Professor, College of Professional Studies; Western New England University School of Law, JD

Javed A. Aslam
Professor, Computer and Information Science; Massachusetts Institute of Technology, PhD

Yernat Assylbekov
Postdoctoral Teaching Associate, Mathematics; University of Washington, PhD

Anand Asthagiri
Associate Professor, Bioengineering; Massachusetts Institute of Technology, PhD

Nicholas Athanassiou
Associate Professor, International Business and Strategy; University of South Carolina, PhD

Polly Attwood
Associate Teaching Professor, Education; Harvard University, EdD

John Auerbach
Professor of the Practice, Institute on Urban Health Research; Boston University, MBA

Debra Auguste
Professor, Chemical Engineering; Princeton University, PhD

Earlene Avalon
Assistant Teaching Professor, College of Professional Studies; Simmons College, PhD

Cheryl Avitabile
Assistant Clinical Professor, Nursing; Massachusetts General Hospital Institute of Health Professions, DNP

Joseph L. Ayers
Professor, Marine and Environmental Sciences; University of California, Santa Cruz, PhD

Kenneth P. Baclawski
Associate Professor, Computer and Information Science; Harvard University, PhD

Sophie Bacq
Assistant Professor, Entrepreneurship and Innovation; Louvain School of Management (Belgium), PhD

Robert Baginski
Assistant Clinical Professor, Physician Assistant Program; University of Connecticut, DSc

Rekha Bai
Lecturer, Mathematics; University of Iowa, PhD

Moya Bailey
Assistant Professor, English; Emory University, PhD

Richard H. Bailey
Professor, Marine and Environmental Sciences; University of North Carolina, Chapel Hill, PhD

Wendy Bailey
Associate Professor, Accounting; University of Pittsburgh, PhD

Carolyn Bair
Assistant Teaching Professor, College of Professional Studies; Loyola University, Chicago, PhD

Ambika Bajpayee
Assistant Professor, Bioengineering; Massachusetts Institute of Technology, PhD

Allison Baker
Lecturer, Psychology; Northeastern University, PhD

Julie Baker
Associate Teaching Professor, English; Southern New Hampshire University, MFA

Apostolia Baki
Research Assistant Professor, Pharmaceutical Sciences; University of Athens (Greece), PhD

Charles Bame-Aldred
Associate Academic Specialist, Accounting; University of Massachusetts, Amherst, PhD

Elitsa Banalieva
Associate Professor and Gary Gregg Faculty Fellow, International Business and Strategy; Indiana University, PhD

Debra Bangs
Assistant Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Massachusetts General Hospital Institute of Health Professions, DPT

Brendan Bannister
Associate Professor, Management and Organizational Development; Kent State University, DBA

Arun Bansil
University Distinguished Professor, Physics; Harvard University, PhD

Albert-Laszlo Barabasi
Robert Gray Dodge Professor of Network Science and University Distinguished Professor, Computer and Information Science and Physics; Boston University, PhD

Amy Barber
Postdoctoral Teaching Associate, Communication Studies; University of Wisconsin, Madison, PhD

Emanuela Barberis
Associate Professor, Physics; University of California, Santa Cruz, PhD

G. Elise Barboza
Assistant Professor, African-American Studies and Criminology and Criminal Justice; Michigan State University, PhD

Gloria Barczak
Professor, Marketing; Syracuse University, PhD

Jay Bardhan
Assistant Professor, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, PhD

Cynthia L. Baron
Associate Academic Specialist, College of Professional Studies; Northeastern University, MBA

Amílcar A. Barreto Jr.
Associate Professor, Political Science; State University of New York, Buffalo, PhD

Yakov Bart
Assistant Professor, Marketing; University of California, Berkeley, PhD

Stefano Basagni
Associate Professor, Electrical and Computer Engineering; University of Texas, Dallas, PhD

Marla Baskerville
Assistant Professor, Management and Organizational Development; Tulane University, PhD

John Basl
Assistant Professor, Philosophy and Religion; University of Wisconsin, Madison, PhD

Maureen Basmajian
Associate Cooperative Education Coordinator, D'Amore-McKim School of Business; Boston College, MBA

Linnea M. Basu
Assistant Cooperative Education Coordinator, College of Social Sciences and Humanities; Northeastern University, MS

Oleg Batishchev
Professor of the Practice, Physics; Moscow Institute of Physics and Technology (Russia), PhD

Christopher E. Beasley
Associate Professor, Mathematics; Princeton University, PhD

Nicholas Beauchamp
Assistant Professor, Political Science; New York University, PhD

Michelle A. Beauchesne
Associate Professor, Nursing; Boston University, DNSc

Mike Beaudet
Professor of the Practice, Journalism; Northeastern University, MS

Gail S. Begley
Teaching Professor, Biology; Boston University, PhD

Mehdi Behroozi
Assistant Professor, Mechanical and Industrial Engineering; University of Minnesota, PhD

Edward Beighley
Associate Professor, Civil and Environmental Engineering; University of Maryland, PhD

Kerri Beiswenger
Associate Cooperative Education Coordinator, College of Engineering; Northeastern University, MBA

Bianca T. Belcher
Assistant Clinical Professor, Physician Assistant Program; Northeastern University, MS

Leo Beletsky
Assistant Professor, Health Sciences and Law; Temple University, JD

Carole Bell
Assistant Professor, Communication Studies; University of North Carolina, Chapel Hill, PhD

Chiara Bellini
Assistant Professor, Bioengineering; University of Calgary (Canada), PhD

Sidi Bencherif
Assistant Professor, Chemical Engineering; Carnegie Mellon University, PhD

Jonathan Benda
Lecturer, English; Syracuse University, PhD

Elizabeth Bennett
Associate Teaching Professor, Education; University of Georgia, PhD

James C. Benneyan
Professor, Mechanical and Industrial Engineering; University of Massachusetts, Amherst, PhD

Iris Berent
Professor, Psychology; University of Pittsburgh, PhD

Kostia Bergman
Associate Professor, Biology; California Institute of Technology, PhD

Dionisio Bernal
Professor, Civil and Environmental Engineering; University of Tennessee, PhD

Eugene A. Bernstein
Associate Teaching Professor, Pharmaceutical Sciences; Ivanovo Medical Institute (Russia), PhD

Craig T. Bettinson
Director of Cooperative Education, College of Arts, Media and Design; Northeastern University, MEd

Penny Beuning
Associate Professor, Chemistry and Chemical Biology; University of Minnesota, PhD

Peter Bex
Professor, Psychology; Cardiff University (United Kingdom), PhD

Dapeng Bi
Assistant Professor, Physics; Brandeis University, PhD

Timothy Bickmore
Professor, Computer and Information Science; Massachusetts Institute of Technology, PhD

Ricardo Binetti
Assistant Academic Specialist, World Languages Center; University of Massachusetts, Amherst, MA

Allan Bird
Brodsky Trustee Professor of Global Business, International Business and Strategy; University of Oregon, PhD

Donna M. Bishop
Professor, Criminology and Criminal Justice; State University of New York, Albany, PhD

Nathan Blake
Associate Teaching Professor, Media and Screen Studies; University of California, PhD

Samuel J. Blank
Professor, Mathematics; Brandeis University, PhD

Robert J. Blaser
Associate Cooperative Education Coordinator, Bouvé College of Health Sciences; Massachusetts College of Pharmacy, MS

Martin H. Blatt
Professor of the Practice, History; Boston University, PhD

Francis C. Blessington
Professor, English; Brown University, PhD

Cameron Blevis
Assistant Professor, History; Stanford University, PhD

Aaron S. Block
Assistant Teaching Professor, English; Emerson College, MFA

Barry Bluestone
Russell B. and Andrée B. Stearns Trustee Professor of Political Economy, Public Policy and Urban Affairs; University of Michigan, PhD

Linda M. Blum
Professor, Sociology and Anthropology; University of California, Berkeley, PhD

Rhonda M. Board
Associate Professor, Nursing; Ohio State University, PhD

Janet Bobcean
Associate Professor, Theatre; Ohio University, MFA

Erika M. Boeckeler
Assistant Professor, English; Harvard University, PhD

Charles Bognanni
Senior Cooperative Education Coordinator, D'Amore-McKim School of Business; Northeastern University, MEd

Norman R. Boisse
Associate Professor, Pharmaceutical Sciences; Cornell University, PhD

Paul J. Bolster
Professor, Finance; Virginia Polytechnic Institute, PhD

Alice Bonner
Associate Professor, Nursing; University of Massachusetts, Worcester, PhD

Lorraine A. Book
Assistant Clinical Professor, Communication Sciences and Disorders; Florida State University, PhD

Raymond G. Booth
Professor, Pharmaceutical Sciences and Chemistry and Chemical Biology; University of California, San Francisco, PhD

Michelle Borkin
Assistant Professor, Computer and Information Science; Harvard University, PhD

Natalie Bormann
Associate Teaching Professor, Political Science; University of Newcastle upon Tyne (United Kingdom), PhD

Jeffery A. Born
Professor, Finance; University of North Carolina, Chapel Hill, PhD

Christopher J. Bosso
Professor, Public Policy and Urban Affairs; University of Pittsburgh, PhD

Ekaterina Botchkovar
Associate Professor, Criminology and Criminal Justice; North Carolina State University, PhD

Kevin Boudreau
Associate Professor, Entrepreneurship and Innovation; Massachusetts Institute of Technology, PhD

Alma L. Bournazian
Associate Academic Specialist, World Languages Center; Western Maryland College, MS

Stacey Bourns
Professor, College of Social Sciences and Humanities; University of Texas, Austin, PhD

Carla Bouwmeester
Associate Clinical Professor, Pharmacy and Health Systems Sciences; Massachusetts College of Pharmacy, PharmD

Jennifer Bowen
Associate Professor, Marine and Environmental Sciences; Boston University, PhD

James Boyer
Assistant Academic Specialist, Accounting; Northeastern University, MBA

Nicole M. Boyson
Associate Professor and William Conley Faculty Fellow, Finance; Ohio State University, PhD

Kara Braciale
Lecturer, Art + Design; University of Illinois, Chicago, MFA

Anthony Braga
Distinguished Professor, School of Criminology and Criminal Justice; Rutgers University, PhD

Maxim Braverman
Professor, Mathematics; Tel Aviv University (Israel), PhD

Heather Brenhouse
Assistant Professor, Psychology; Northeastern University, PhD

Janet Briand-McGowan
Assistant Clinical Professor, Nursing; Northeastern University, DNP

Becky A. Briesacher
Associate Professor, Pharmacy and Health Systems Sciences; University of Maryland, Baltimore, PhD

Amy M. Briesch
Associate Professor, Applied Psychology; University of Connecticut, PhD

Elizabeth C. Britt
Associate Professor, English; Rensselaer Polytechnic Institute, PhD

Sharon M. Britton
Assistant Cooperative Education Coordinator, College of Engineering; Massachusetts Institute of Technology, MS

Bonnie Brock
Associate Cooperative Education Coordinator, D'Amore-McKim School of Business; University of Vermont, MEd

Oscar T. Brookins
Associate Professor, Economics; State University of New York, Buffalo, PhD

Dana H. Brooks
Professor, Electrical and Computer Engineering; Northeastern University, PhD

Cammy Brothers
Associate Professor, Architecture and Art + Design; Harvard University, PhD

Michael E. Brown
Professor, Sociology and Anthropology; University of Michigan, JD, PhD

Philip M. Brown
Professor, Sociology and Anthropology and Health Sciences; Brandeis University, PhD

Ronald Brown
Assistant Teaching Professor, College of Professional Studies; Harvard University, EdD

Timothy S. Brown
Professor, History; University of California, Berkeley, PhD

Todd A. Brown
Clinical Instructor, Pharmacy and Health Systems Sciences; Northeastern University, MHP

Corliss Brown-Thompson
Assistant Teaching Professor, College of Professional Studies; University of North Carolina, Chapel Hill, PhD

Maria Brucato
Associate Academic Specialist, World Languages Center; University of Texas, PhD

Elizabeth M. Bucar
Associate Professor, Philosophy and Religion; University of Chicago, PhD

David E. Budil
Associate Professor, Chemistry and Chemical Biology; University of Chicago, PhD

Mindelyn Buford II
Assistant Professor, Sociology and Anthropology; Johns Hopkins University, PhD

Lucy Bunning
Assistant Teaching Professor, College of Professional Studies; Lesley University, PhD

Jeffrey Burds
Associate Professor, History; Yale University, PhD

Lynn H. Burke
Senior Cooperative Education Coordinator, College of Arts, Media and Design; University of Massachusetts, Amherst, MEd

Pamela J. Burke
Clinical Professor, Nursing; Boston College, PhD

Jose Buscaglia
Professor, Languages, Literatures, and Cultures; University of Buffalo, PhD

Jeremy P. Bushnell
Assistant Teaching Professor, English; University of Arizona, Tucson, MFA

Ahmed A. Busnaina
William Lincoln Smith Professor of Mechanical Engineering, Mechanical and Industrial Engineering; Oklahoma State University, PhD

Michael Butera
Clinical Instructor, Nursing; Northeastern University, MS

Victoria Cain
Assistant Professor, History; Columbia University, PhD

Paula Caligiuri
Distinguished Professor of Global Leadership, International Business and Strategy; Pennsylvania State University, PhD

Lisa Campagnoni
Assistant Cooperative Education Coordinator, College of Science; Northeastern University, MA

Octavia Camps
Professor, Electrical and Computer Engineering; University of Washington, PhD

Clinton Canal
Research Assistant Professor, Pharmaceutical Sciences; University of Illinois, PhD

Yanet Canavan
Assistant Academic Specialist, World Languages Center; Salem State College, MA

Kristopher Cannon
Assistant Teaching Professor, Media and Screen Studies; Georgia State University, PhD

Alessandro Canossa
Associate Professor, Game Design; Royal Danish Academy of Fine Arts (Netherlands), PhD

Mira Cantor
Professor, Art + Design; University of Illinois, Urbana-Champaign, MFA

Michele Cao-Danh
Associate Academic Specialist, World Languages Center; Boston University, PhD

Luca Caracoglia
Associate Professor, Civil and Environmental Engineering; University of Trieste (Italy), PhD

Benjamin Caras
Lecturer, Art + Design; University of Massachusetts, Amherst, MFA

Amy M. Carleton
Visiting Lecturer, English; Northeastern University, PhD

Joelle Carlo
Assistant Teaching Professor, Pharmaceutical Sciences; State University of New York, Buffalo, PhD

Alexa A. Carlson
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; Butler University, PharmD

Mary Carney
Associate Cooperative Education Coordinator, Bouvé College of Health Sciences; Boston College, MSN

Heather Carpenter
Assistant Cooperative Education Coordinator, College of Engineering; Northeastern University, MS

Jonathan Carr
Assistant Teaching Professor, Theatre; Columbia University, MFA

Michelle Carr
Lecturer, Communication Studies; Kingston University (United Kingdom), MA

Rebecca L. Carrier
Associate Professor, Chemical Engineering; Massachusetts Institute of Technology, PhD

Patricia Case
Assistant Teaching Professor, Health Sciences; Harvard University, ScD

Ana-Maria Castravet
Associate Professor, Mathematics; Massachusetts Institute of Technology, PhD

Smajl Cenjic
Assistant Cooperative Education Coordinator, Computer and Information Science; Cambridge College, MA

Robert J. Cersosimo
Associate Professor, Pharmacy and Health Systems Sciences; University of Utah, PharmD

Christopher Cesario
Assistant Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Yunrong Chai
Assistant Professor, Biology; Cornell University, PhD

Srinath Chakravarthy
Assistant Professor, Mechanical and Industrial Engineering; University of Connecticut, PhD

Christopher Chambers
Lecturer, Sociology and Anthropology; Texas AM University, PhD

Paul M. Champion
Professor, Physics; University of Illinois, Urbana-Champaign, PhD

Chee Chan
Assistant Academic Specialist, Marketing; Michigan State University, PhD

Robin M. Chandler
Associate Professor, African-American Studies; Northeastern University, PhD

Suzanne Charles
Assistant Professor, Architecture; Harvard University, PhD

Yi-Da Chen
Assistant Professor, Supply Chain and Information Management; University of Arizona, PhD

Esther Chewning
Associate Cooperative Education Coordinator, D'Amore-McKim School of Business; Suffolk University, MS

Elizabeth A. Chilvers
Associate Professor, Cooperative Education, D'Amore-McKim School of Business; Northeastern University, MEd

W. Paul Chiou
Assistant Teaching Professor, Finance; Rutgers University, PhD

David R. Choffnes
Assistant Professor, Computer and Information Science; Northwestern University, PhD

Sam S. Choi
Associate Teaching Professor, Architecture; Harvard University, MArch

Sunho Choi
Assistant Professor, Chemical Engineering; University of Minnesota, PhD

Chun-An Chou
Assistant Professor, Mechanical and Industrial Engineering; Rutgers University, PhD

Kaushik Roy Chowdhury
Associate Professor, Electrical and Computer Engineering; University of Cincinnati, MS

Ken Chung
Assistant Teaching Professor, Chemistry and Chemical Biology; Michigan State University, PhD

Hillary Chute
Professor, English; Rutgers University, PhD

John W. Cipolla Jr.
Donald W. Smith Professor of Mechanical Engineering and College of Engineering Distinguished Professor, Mechanical and Industrial Engineering; Brown University, PhD

Dawn M. Cisewski
Assistant Teaching Professor, Psychology; Indiana University of Pennsylvania, PsyD

Bruce H. Clark
Associate Professor, Marketing; Stanford University, PhD

Edmund L. Clark
Associate Academic Specialist, Entrepreneurship and Innovation; Clark University, MBA

Heather Clark
Professor, Pharmaceutical Sciences; University of Michigan, PhD

Sean Clark
Postdoctoral Teaching Associate, Mathematics; University of Virginia, PhD

Stephen B. Clark
Assistant Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Alan Clayton-Matthews
Associate Professor, Public Policy and Urban Affairs and Economics; Boston College, PhD

Sandra S. Cleveland
Associate Clinical Professor, Communication Sciences and Disorders; Pennsylvania College of Optometry, AuD

William D. Clinger
Associate Professor, Computer and Information Science; Massachusetts Institute of Technology, PhD

Paul Closas
Assistant Professor, Electrical and Computer Engineering; Universitat Politècnica de Catalunya (Spain), PhD

Irina Cojuharenco
Assistant Teaching Professor, Management and Organizational Development; Universitat Pompeu Fabra (Spain), PhD

Dennis R. Cokely
Professor, American Sign Language and Languages, Literatures, and Cultures and World Languages Center; Georgetown University, PhD

Maxine Cokely
Associate Academic Specialist, College of Professional Studies; Bowie State University, MEd

Stephanie Colby
Assistant Teaching Professor, College of Professional Studies; Eastern University, PhD

John D. Coley
Associate Professor, Psychology; University of Michigan, PhD

C. Randall Colvin
Associate Professor, Psychology; University of Illinois, Urbana-Champaign, PhD

Sally Conant
Assistant Cooperative Education Coordinator, College of Engineering; Salve Regina University, MA

Michelle Conceison
Assistant Teaching Professor, Music; Simmons College, MBA

Michael Conley
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; Northeastern University, PharmD

Richard C. Conley
Assistant Cooperative Education Coordinator, College of Social Sciences and Humanities; Boston University, JD

Kelly Conn
Assistant Teaching Professor, College of Professional Studies; Boston University, PhD

Carol Connolly
Clinical Instructor, Nursing; Northeastern University, MS

Gregory Connolly
Research Professor, Law and Health Sciences; Tufts University, PhD

James J. Connolly
Assistant Professor, Public Policy and Urban Affairs and Political Science; Columbia University, PhD

Adam Cooper
Lecturer, Linguistics; Cornell University, PhD

Seth Cooper
Assistant Professor, Computer and Information Science; University of Washington, PhD

Gene D. Cooperman
Professor, Computer and Information Science; Brown University, PhD

Debra Copeland
Associate Clinical Professor, Pharmacy and Health Systems Sciences; University of Rhode Island, PharmD

Ryan C. Cordell
Assistant Professor, English; University of Virginia, PhD

Marie B. Corkery
Associate Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Felipe Cortes
Assistant Professor, Finance; Washington University, St. Louis, PhD

Kristen Costa
Assistant Teaching Professor, College of Professional Studies; Northeastern University, EdD

Hugh G. Courtney
Professor, International Business and Strategy; Massachusetts Institute of Technology, PhD

Arthur J. Coury
Professor, Chemical Engineering; University of Minnesota, PhD

Erin Cram
Associate Professor, Biology; University of California, Berkeley, PhD

Frederick Crane
Senior Academic Specialist, Entrepreneurship and Innovation; Bradford University, PhD

Steven Cranford
Assistant Professor, Civil and Environmental Engineering; Massachusetts Institute of Technology, PhD

William F. Crittenden
Professor, International Business and Strategy; University of Arkansas, PhD

Mai'a K. D. Cross
Associate Professor, Political Science; Princeton University, PhD

Christina Crowe
Lecturer, Psychology; Boston College, PhD

Jessica Crowley
Assistant Cooperative Education Coordinator, D'Amore-McKim School of Business; Boston College, MA

Alvaro Cuervo-Cazurra
Professor and Robert Morrison Fellow, International Business and Strategy; Massachusetts Institute of Technology, PhD

Carlos A. Cuevas
Associate Professor, Criminology and Criminal Justice; Alliant International University, PhD

Thomas P. Cullinane
Professor, Mechanical and Industrial Engineering; Virginia Polytechnic Institute and State University, PhD

Kamran M. Dadkhah
Associate Professor, Economics; Indiana University, PhD

Guohao Dai
Associate Professor, Bioengineering; Massachusetts Institute of Technology, PhD

Elise J. Dallimore
Associate Professor, Communication Studies; University of Washington, PhD

James D. Dana Jr.
Professor, Economics and International Business and Strategy; Massachusetts Institute of Technology, PhD

Luis Dau
Associate Professor, International Business and Strategy; University of South Carolina, PhD

Geoffrey Davies
Matthews Distinguished University Professor, Chemistry and Chemical Biology; Birmingham University (United Kingdom), PhD, DSc

Frederick C. Davis
Professor, Biology; University of Texas, Austin, PhD

Michael Davis
Postdoctoral Teaching Associate, Communication Studies; University of Tennessee, PhD

Theo Davis
Associate Professor, English; Johns Hopkins University, PhD

Leslie Day
Assistant Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, PhD

Anthony P. De Ritis
Professor, Music and Entrepreneurship and Innovation; University of California, Berkeley, PhD

Adenekan (Nick) Dedeke
Lecturer, Supply Chain and Information Management; Technische Universität Kaiserslautern (Germany), PhD

Plinio DeGoes
Assistant Academic Specialist, College of Professional Studies; Northwood University, MA

Mohammad Dehghanimohammadabadi
Assistant Teaching Professor, Mechanical and Industrial Engineering; Western New England University, PhD

Richard DeJordy
Assistant Professor, Management and Organizational Development; Boston College, PhD

Candice Delams
Assistant Professor, Political Science and Philosophy; Boston University, PhD

John Dencker
Associate Professor, Management and Organizational Development; Harvard University, PhD

Jack Dennerlein
Professor, Physical Therapy, Movement, and Rehabilitation Sciences; University of California, PhD

Jacob Depue
Postdoctoral Teaching Associate, Communication Studies; University of Minnesota, PhD

Leila Deravi
Assistant Professor, Chemistry and Chemical Biology; Vanderbilt University, PhD

Marco Deseriis
Assistant Professor, Media and Screen Studies; New York University, PhD

Peter J. Desnoyers
Associate Professor, Computer and Information Science; University of Massachusetts, Amherst, PhD

David A. DeSteno
Professor, Psychology; Yale University, PhD

Sebastian Deterding
Assistant Professor, Game Design; Hamburg University (Germany), PhD

H. William Detrich
Professor, Marine and Environmental Sciences; Yale University, PhD

John W. Devlin
Professor, Pharmacy and Health Systems Sciences; University of Toronto (Canada), PharmD

Janet Dewan
Assistant Clinical Professor, Nursing; Northeastern University, PhD

Jacqueline Diani
Senior Cooperative Education Coordinator, Bouvé College of Health Sciences; University of Virginia, MEd

Martin Dias
Assistant Professor, Supply Chain and Information Management; Bentley University, PhD

William T. Dickens
University Distinguished Professor, Economics and Public Policy and Urban Affairs; Massachusetts Institute of Technology, PhD

Alessandra DiCredico
Lecturer, Physics; University of Rome (Italy), PhD

Max Diem
Professor, Chemistry and Chemical Biology; University of Toledo, PhD

Elizabeth Maddock Dillon
Professor, English; University of California, Berkeley, PhD

Charles DiMarzio
Associate Professor, Electrical and Computer Engineering; Northeastern University, PhD

Paul DiMilla
Associate Teaching Professor, Chemistry and Chemical Biology and Chemical Engineering; University of Pennsylvania, PhD

Edward Dinan
Lecturer, Accounting; Harvard University, MS

Aidong Adam Ding
Associate Professor, Mathematics; Cornell University, PhD

Kathleen B. Dioli
Assistant Cooperative Education Coordinator, Chemistry and Chemical Biology; Bowling Green State University, MA

Brandon Dionne
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; University of New England, PharmD

Daniel Distel
Research Professor, Marine and Environmental Sciences; University of California, San Diego, PhD

Margarita V. DiVall
Clinical Professor, Pharmacy and Health Systems Sciences; Northeastern University, PharmD

Lisa Cantwell Doherty
Assistant Cooperative Education Coordinator, College of Social Sciences and Humanities; Northeastern University, MA

Silvia Dominguez
Associate Professor, Sociology and Anthropology; Boston University, PhD

Hua Dong
Associate Academic Specialist, World Languages Center; Emerson College, MA

Brenda Douglas
Associate Clinical Professor, Nursing; Northeastern University, PhD

Mark Douglass
Associate Clinical Professor, Pharmacy and Health Systems Sciences; University of Michigan, PharmD

Kevin M. Drakulich
Assistant Professor, Criminology and Criminal Justice; University of Washington, PhD

Laura Dudley
Clinical Instructor, Applied Psychology; Northeastern University, MS

Molly Dugan
Assistant Teaching Professor, College of Professional Studies; Boston College, PhD

Michael S. Dukakis
Distinguished Professor, Political Science; Harvard University, JD

Daniel M. Dulaski
Associate Teaching Professor, Civil and Environmental Engineering; University of Massachusetts, Amherst, PhD

Catherine Dunand
Assistant Academic Specialist, World Languages Center; Boston University, MA

Joanne Dupuis
Assistant Clinical Professor, Nursing; Massachusetts School of Law, JD

Douglas F. Durant
Lecturer, Music; Brandeis University, PhD

Kathleen Durant
Lecturer, Computer and Information Science; Harvard University, PhD

Jennifer G. Dy
Associate Professor, Electrical and Computer Engineering; Purdue University, PhD

Lauren D'Abrosca
Assistant Cooperative Education Coordinator, Finance; Boston University, MEd

Philip Anthony D'Agati
Associate Teaching Professor, Political Science; Northeastern University, MA

Eno Ebong
Assistant Professor, Chemical Engineering; Rensselaer Polytechnic Institute, PhD

Matthew Eckelman
Assistant Professor, Civil and Environmental Engineering; Yale University, PhD

Kimberly Eddleston
Professor and Daniel and Dorothy Grady Faculty Fellow, Entrepreneurship and Innovation; University of Connecticut, PhD

Scott Edmiston
Professor of the Practice, Theatre; Boston University, MFA

Laurie E. Edwards
Associate Teaching Professor, English; Emerson College, MFA

Jessica Edwards George
Associate Clinical Professor, Applied Psychology; Northeastern University, PhD

Christopher Egan
Assistant Cooperative Education Coordinator, College of Science; Boston University, MA

Jean F. Egan
Associate Cooperative Education Coordinator, College of Social Sciences and Humanities; Northeastern University, MEd

Stanley J. Eigen
Professor, Mathematics; McGill University (Canada), PhD

Adam Ekenseair
Assistant Professor, Chemical Engineering; University of Texas, Austin, PhD

Ehsan Elhamifar
Assistant Professor, Computer and Information Science; Johns Hopkins University, PhD

Simone Elias
Assistant Academic Specialist, World Languages Center; Harvard University, MA

Tina Eliassi-Rad
Associate Professor, Computer and Information Science; University of Wisconsin, Madison, PhD

Ryan Ellis
Assistant Professor, Communication Studies; University of California, San Diego, PhD

Constance Emerson
Assistant Academic Specialist, College of Professional Studies; Purdue University, West Lafayette, MS

John Engen
Professor, Chemistry and Chemical Biology and Barnett Institute; University of Nebraska, Lincoln, PhD

Christen Enos
Lecturer, English; Emerson College, MFA

Slava S. Epstein
Professor, Biology; Moscow State University (Russia), PhD

Randall Erb
Assistant Professor, Mechanical and Industrial Engineering; Duke University, PhD

Deniz Erdogmus
Associate Professor, Electrical and Computer Engineering; University of Florida, PhD

Awatef Ergai
Assistant Teaching Professor, Mechanical and Industrial Engineering; Clemson University, PhD

Ozlem Ergun
Professor, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, PhD

Cuneyt Eroglu
Associate Professor, Supply Chain and Information Management; Ohio State University, PhD

Bilge Erten
Assistant Professor, Economics and International Affairs; University of Massachusetts, Amherst, PhD

Rhea T. Eskew
Professor, Psychology; Georgia Institute of Technology, PhD

Jonathan Esole
Assistant Professor, Mathematics; Leiden University (Netherlands), PhD

Neenah Estrella-Luna
Associate Teaching Professor, College of Professional Studies; Northeastern University, PhD

Sara Ewell
Associate Teaching Professor, College of Professional Studies; University of North Carolina, Chapel Hill, PhD

Daniel R. Faber
Professor, Sociology and Anthropology; University of California, Santa Cruz, PhD

Olubunmi Faleye
Professor, Trahan Family Faculty Fellow, and Walsh Research Professor, Finance; University of Alberta (Canada), PhD

Hui Fang
Assistant Professor, Electrical and Computer Engineering; University of California, Berkeley, PhD

Qianqian Fang
Assistant Professor, Bioengineering; Dartmouth University, PhD

David Fannon
Assistant Professor, Architecture and Civil and Environmental Engineering; University of California, Berkeley, MS Arch

Nasser S. Fard
Associate Professor, Mechanical and Industrial Engineering; University of Arizona, PhD

Amir Farhat
Associate Teaching Professor, Electrical and Computer Engineering; University of Pennsylvania, PhD

Amy S. Farrell
Associate Professor, Criminology and Criminal Justice; Northeastern University, PhD

Christopher Featherman
Assistant Teaching Professor, English; University of Washington, PhD

Mary Federico
Assistant Cooperative Education Coordinator, College of Engineering; Indiana University, MS

Yunsi Fei
Associate Professor, Electrical and Computer Engineering; Princeton University, PhD

Adrian Feiguin
Assistant Professor, Physics; Universidad Nacional de Rosario (Argentina), PhD

Daniel Feinberg
Assistant Clinical Instructor, Computer and Information Science and Health Sciences; Boston University, MBA

Allen G. Feinstein
Teaching Professor, Music; New England Conservatory of Music, MM

Nathan I. Felde
Professor, Art + Design; Massachusetts Institute of Technology, MS

Lisa Feldman Barrett
University Distinguished Professor, Psychology; University of Waterloo (Canada), PhD

Matthias Felleisen
Trustee Professor, Computer and Information Science; Indiana University, PhD

Samuel Felton
Assistant Professor, Mechanical and Industrial Engineering; Harvard University, PhD

Carol Femia
Clinical Instructor, Nursing; Massachusetts General Hospital Institute of Health Professions, MS

Hicham Fenniri
Professor, Chemical Engineering; Université de Strasbourg (France), PhD

Loretta A. Fernandez
Assistant Professor, Civil and Environmental Engineering and Marine and Environmental Sciences; Massachusetts Institute of Technology, PhD

Waththage Neranga Fernando
Lecturer, Mathematics; University of South Florida, PhD

Craig F. Ferris
Professor, Psychology and Pharmaceutical Sciences; New York Medical College, PhD

Kirsten Fertuck
Assistant Teaching Professor, Biochemistry; Michigan State University, PhD

Susan F. Fine
Clinical Instructor, Communication Sciences and Disorders; New York University, MA

Sarah Finn
Assistant Teaching Professor, English; University of Massachusetts, Amherst, PhD

Branden Fitelson
Distinguished Professor, Philosophy and Religion; California Institute of Technology, PhD

Brian Fitzgerald
Assistant Professor, Accounting; Texas AM University, PhD

Joan Fitzgerald
Professor, Law and Public Policy and Public Policy and Urban Affairs; Pennsylvania State University, PhD

John E. Fitzmaurice
Assistant Cooperative Education Coordinator, College of Engineering; College of William and Mary, MBA

Diane F. Fitzpatrick
Associate Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Julia H. Flanders
Professor of the Practice, English and University Libraries; Brown University, PhD

Peggy L. Fletcher
Lecturer, Finance; University of Pittsburgh, MBA

Ann Marie Flores
Assistant Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Ohio State University, PhD

Marcial Flores
Assistant Academic Specialist, World Languages Center; Boston College, MA

Eric Folmar
Assistant Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Paul Fombelle
Associate Professor, Marketing; Arizona State University, PhD

Murray Forman
Professor, Media and Screen Studies; McGill University (Canada), PhD

Lisa M. Foster
Assistant Cooperative Education Coordinator, Bouvé College of Health Sciences; Northeastern University, MS

Dimitrios Fotiadis
Lecturer, Supply Chain and Information Management; Northeastern University, MS

Brooke Foucault Welles
Assistant Professor, Communication Studies; Northwestern University, PhD

Charles F. Fountain
Associate Professor, Journalism; Columbia University, MS

William M. Fowler Jr.
Distinguished Professor, History; University of Notre Dame, PhD

James Alan Fox
Lipman Family Professor, Criminology and Criminal Justice and Law and Public Policy; University of Pennsylvania, PhD

Laura L. Frader
Professor, History; University of Rochester, PhD

Debra L. Franko
Professor, Applied Psychology; McGill University (Canada), PhD

Susan Freeman
Teaching Professor, Engineering; Northeastern University, PhD

Clark Freifeld
Lecturer, Computer and Information Science; Boston University, PhD

Michael Frengel
Associate Academic Specialist, Music; City University London (United Kingdom), PhD

John H. Friar
Senior Academic Specialist, Entrepreneurship and Innovation; Massachusetts Institute of Technology, PhD

Natasha Frost
Associate Professor, Criminology and Criminal Justice; City University of New York, PhD

Yun (Raymond) Fu
Assistant Professor, Electrical and Computer Engineering and Computer and Information Science; University of Illinois, Urbana-Champaign, PhD

Brian Fulton
Lecturer, Chemistry and Chemical Biology; Iowa State University, PhD

Peter G. Furth
Professor, Civil and Environmental Engineering; Massachusetts Institute of Technology, PhD

Terence J. Gaffney
Professor, Mathematics; Brandeis University, PhD

Timothy Gagnon
Associate Academic Specialist, Accounting; Sacred Heart University, MBA

Ronen Gal-Or
Assistant Professor, Accounting; University of Arizona, PhD

Chris W. Gallagher
Professor, English; University of New York, Albany, PhD

Susan Gallagher
Clinical Instructor, Nursing; Massachusetts General Hospital Institute of Health Professions, MS

Auroop Ganguly
Associate Professor, Civil and Environmental Engineering; Massachusetts Institute of Technology, PhD

Denise Garcia
Associate Professor, Political Science and International Affairs; University of Geneva (Switzerland), PhD

Lori Gardinier
Associate Teaching Professor, Human Services; Northeastern University, PhD

Karen Garneau
Associate Teaching Professor, English; Northeastern University, PhD

Samuel John Gatley
Professor, Pharmaceutical Sciences; University of Newcastle upon Tyne (United Kingdom), PhD

Nicole Georgallas
Lecturer, Communication Studies; Emerson College, MA

Prasanth George
Assistant Teaching Professor, Mathematics; State University of New York, Buffalo, PhD

Carleton Gholz
Postdoctoral Teaching Associate, Communication Studies; University of Pittsburgh, PhD

Roger W. Giese
Professor, Pharmaceutical Sciences; Massachusetts Institute of Technology, PhD

Joseph M. Giglio
Senior Academic Specialist, International Business and Strategy; Northeastern University, PhD

Richard Gilbert
Research Professor, Chemistry and Chemical Biology; New Jersey Medical School, PhD

Thomas R. Gilbert
Associate Professor, Chemistry and Chemical Biology; Massachusetts Institute of Technology, PhD

Laurance Ginsberg
Assistant Academic Specialist, Accounting; Bentley University, MST

Leonard J. Glick
Senior Academic Specialist, Management and Organizational Development; Harvard University, EdD

Veronica Godoy-Carter
Associate Professor, Biology; Tufts University, PhD

Michael Bradford Goetz
Assistant Teaching Professor, Architecture; University of Pennsylvania, MLA

Kevin Gold
Lecturer, Computer and Information Science; Yale University, PhD

Natalia Gold
Assistant Teaching Professor, International Business and Strategy; Saint Petersburg State University of Engineering (Russia), PhD

Susan Gold
Professor of the Practice, Game Design; Visual Studies Workshop, MS

Donald Goldthwaite
Assistant Teaching Professor, Engineering; Northeastern University, MS

Ann C. Golub-Victor
Associate Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Edgar D. Goluch
Associate Professor, Chemical Engineering; University of Illinois, Urbana-Champaign, PhD

Kathleen R. Gonso
Associate Teaching Professor, English; Emerson College, MFA

Michael J. Gonyeau
Clinical Professor, Pharmacy and Health Systems Sciences; Albany College of Pharmacy, PharmD

Gregory Goodale
Associate Professor, Communication Studies; University of Illinois, Urbana-Champaign, PhD

Pamela W. Goodale
Senior Cooperative Education Coordinator, College of Arts, Media and Design; Boston College, MA

Teresa Goode
Assistant Teaching Professor, College of Professional Studies; Columbia University, EdD

Patricia Goodman
Assistant Teaching Professor, College of Professional Studies; George Washington University, EdD

Matthew Goodwin
Assistant Professor, Health Sciences and Health Informatics; University of Rhode Island, PhD

Mark Gooley
Lecturer, Finance; Northwestern University, MM

Margaret Gorman Kirchoff
Assistant Teaching Professor, College of Professional Studies; George Washington University, EdD

Gary Goshgarian
Professor, English; University of Wisconsin, Madison, PhD

Tarik Gouhier
Assistant Professor, Marine and Environmental Sciences; McGill University (Canada), PhD

Robson Goulart
Assistant Cooperative Education Coordinator, College of Engineering; Boston University, MS

Andrew Gouldstone
Associate Professor, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, PhD

Eugene H. Gover
Associate Professor, Mathematics; Brandeis University, PhD

Jonathan H. Grabowski
Associate Professor, Marine and Environmental Sciences; University of North Carolina, Chapel Hill, PhD

Susan Gracia
Assistant Teaching Professor, College of Professional Studies; Boston College, PhD

Matthew Gray
Assistant Professor, Theatre; London Academy of Music and Dramatic Arts (United Kingdom), MFA

Laura Green
Professor, English; University of California, Berkeley, PhD

Jack R. Greene
Professor, Criminology and Criminal Justice; Michigan State University, PhD

Kristin Curry Greenwood
Associate Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Daniel S. Gregory
Senior Academic Specialist, Entrepreneurship and Innovation and Art + Design; Harvard University, MBA

Sara Grier
Assistant Cooperative Education Coordinator, College of Engineering; Northeastern University, MS

Brent Griffin
Assistant Teaching Professor, CPS International Programs; Northeastern University, PhD

Jacqueline Griffin
Assistant Professor, Mechanical and Industrial Engineering; Georgia Institute of Technology, PhD

Joseph Griffin
Associate Teaching Professor, Project Management; Gordon-Conwell Theological Seminary, South Hamilton, DMin

John Griffith
Clinical Professor, Applied Psychology; Boston University, PhD

Amir Grinstein
Associate Professor, Marketing; Hebrew University of Jerusalem (Israel), PhD

Francesca Grippa
Associate Teaching Professor, College of Professional Studies; University of Salento (Italy), PhD

Craig Gruber
Assistant Teaching Professor, College of Professional Studies; Clark University, PhD

April Gu
Associate Professor, Civil and Environmental Engineering; University of Washington, PhD

Tiantian Gu
Assistant Professor, Finance; University of Wisconsin, Madison, PhD

Jason Guo
Associate Research Professor, Pharmaceutical Sciences; University of Connecticut, Storrs, PhD

Surendra M. Gupta
Professor, Mechanical and Industrial Engineering; Purdue University, PhD

Barbara Guthrie
Professor, Nursing; New York University, PhD

Mohamed Habibullah
Assistant Teaching Professor, Supply Chain and Information Management; University of Missouri, Columbia, PhD

David Hagen
Assistant Teaching Professor, College of Professional Studies; New England School of Law, JD

Jerome F. Hajjar
Professor, Civil and Environmental Engineering; Cornell University, PhD

Judith A. Hall
University Distinguished Professor, Psychology; Harvard University, PhD

Robert L. Hall
Associate Professor, African-American Studies and History; Florida State University, PhD

James Halverson
Assistant Professor, Physics; University of Pennsylvania, PhD

Pauline Hamel
Associate Clinical Professor, Health Sciences; Boston University, EdD

Scott R. Hamilton
Associate Cooperative Education Coordinator, College of Engineering; Stanford University, PhD

William S. Hancock
Raymond and Claire Bradstreet Chair, Chemistry and Chemical Biology; University of Adelaide (Australia), PhD

Michael J. Handel
Associate Professor, Sociology and Anthropology; Harvard University, PhD

Nancy Hanrahan
Professor, Nursing; Boston College, PhD

Bonnie Jo Hanson
Assistant Clinical Professor, Physician Assistant Program; University of New England, MS

Robert N. Hanson
Matthews Distinguished University Professor, Chemistry and Chemical Biology; University of California, Berkeley, PhD

Stephen G. Harkins
Professor, Psychology; University of Missouri, PhD

Sharon Harlan
Professor, Health Sciences; Cornell University, PhD

Kelly Harrington
Assistant Cooperative Education Coordinator, D'Amore-McKim School of Business; Suffolk University, MBA

Shaunna Harrington
Associate Academic Specialist, College of Professional Studies; Boston University, MAT

Vincent Harris
William Lincoln Smith Professor of Electrical and Computer Engineering, Electrical and Computer Engineering; Northeastern University, PhD

Vanecia Harrison-Sanders
Associate Cooperative Education Coordinator, Bouvé College of Health Sciences and College of Science; Emmanuel College, MA

Casper Harteveld
Assistant Professor, Game Design; Delft University of Technology (Netherlands), PhD

Christopher Hasson
Assistant Professor, Physical Therapy, Movement, and Rehabilitation Sciences; University of Massachusetts, Amherst, PhD

Bradley Hatfield
Assistant Teaching Professor, Music; Cambridge College, MM

Stephanie Hattoy
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; University of Rhode Island, PharmD

Heather Hauck
Associate Cooperative Education Coordinator, D'Amore-McKim School of Business; Northeastern University, MS

Thomas Havens
Professor, History; University of California, Berkeley, PhD

Lorna Hayward
Associate Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Boston University, EdD

Ni He
Associate Professor, Criminology and Criminal Justice; University of Nebraska, Omaha, PhD

Julia Hechtman
Lecturer, Art + Design; University of Illinois, Chicago, MFA

Inez Hedges
Professor, Languages, Literatures, and Cultures; University of Wisconsin, Madison, PhD

Gretchen A. Heefner
Assistant Professor, History; Yale University, PhD

Donald E. Heiman
Professor, Physics; University of California, Irvine, PhD

Ferdinand L. Hellweger
Associate Professor, Civil and Environmental Engineering; Columbia University, EngScD

Brian Helmuth
Professor, Marine and Environmental Sciences and Public Policy and Urban Affairs; University of Washington, PhD

Carlene Hempel
Assistant Teaching Professor, Journalism; University of North Carolina, Chapel Hill, MA

Dale Herbeck
Professor, Communication Studies; University of Iowa, PhD

David A. Herlihy
Teaching Professor, Music; Boston College, JD

Catalina Herrera Almanza
Assistant Professor, Economics and International Affairs; Cornell University, PhD

Carie Hersh
Assistant Teaching Professor, Sociology and Anthropology; Duke University, JD

Julie Hertenstein
Associate Professor, Accounting; Harvard University, DBA

Joshua Hertz
Assistant Teaching Professor, Engineering; Massachusetts Institute of Technology, PhD

Mary J. Hickey
Associate Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Carlos Hidrovo Chavez
Assistant Professor, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, PhD

Malcolm D. Hill
Associate Professor, Marine and Environmental Sciences; University of California, Santa Cruz, PhD

Charles Hillman
Professor, Psychology and Health Sciences; University of Maryland, College Park, PhD

Elizabeth Hirsch
Assistant Professor, Pharmacy and Health Systems Sciences; Creighton University, PharmD

Leslie Hitch
Associate Teaching Professor, College of Professional Studies; University of Massachusetts, Boston, EdD

Hubert Ho
Lecturer, Music; University of California, Berkeley, PhD

Marie Odile Hobeika
Postdoctoral Teaching Associate, Communication Studies; University of Pittsburgh, PhD

Lynda Hodgson
Assistant Teaching Professor, College of Professional Studies; Virginia Commonwealth University, PhD

Timothy J. Hoff
Associate Professor, Management and Organizational Development and Public Policy and Urban Affairs; Rockefeller College, PhD

Jessica Hoffman
Associate Professor, Applied Psychology; Lehigh University, PhD

Udi Hoitash
Associate Professor and Denise and Robert DiCenso Term Fellow, Accounting; Rutgers University, PhD

Trenton Honda
Assistant Clinical Professor, Physician Assistant Program; Saint Francis University, MS

Michael J. Hoppmann
Assistant Teaching Professor, Communication Studies; University of Tübingen (Germany), PhD

Elizabeth M. Howard
Associate Professor, Nursing; Boston College, PhD

Jeffrey P. Howe
Assistant Professor, Journalism; Boston University, MFA

Hanchen Huang
Professor, Mechanical and Industrial Engineering; University of California, Los Angeles, PhD

Ian Hudson
Assistant Teaching Professor, College of Professional Studies; Nova Southeastern University, PhD

Anne Randall Hughes
Assistant Professor, Marine and Environmental Sciences; University of California, Davis, PhD

Katlyn Hughes
Assistant Cooperative Education Coordinator, Computer and Information Science; Northeastern University, Certificate of Advanced Study

Francisco Hung
Associate Professor, Chemical Engineering; North Carolina State University, PhD

Matthew O. Hunt
Professor, Sociology and Anthropology; Indiana University, PhD

Mark Huselid
Distinguished Professor of Workforce Analytics, International Business and Strategy; State University of New York, Buffalo, PhD

J. Benjamin Hutchinson
Assistant Professor, Psychology; Stanford University, PhD

Roxana Iacob
Research Assistant Professor, Barnett Institute; Konstanz University (Germany), PhD

Anthony Iarrobino
Professor, Mathematics; Massachusetts Institute of Technology, PhD

Patricia M. L. Illingworth
Professor, Philosophy and Religion; University of California, San Diego, PhD; Boston University, JD

Vinay K. Ingle
Associate Professor, Electrical and Computer Engineering; Rensselaer Polytechnic Institute, PhD

Rei Okamoto Inouye
Associate Academic Specialist, World Languages Center; Temple University, PhD

Stephen S. Intille
Associate Professor, Computer and Information Science and Health Sciences; Massachusetts Institute of Technology, PhD

Efstratis Ioannidis
Assistant Professor, Electrical and Computer Engineering; University of Toronto (Canada), PhD

Roderick L. Ireland
Distinguished Professor, Criminology and Criminal Justice; Harvard University, LLM; Northeastern University, PhD

Derek Isaacowitz
Professor, Psychology; University of Pennsylvania, PhD

Jacqueline A. Isaacs
Professor, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, PhD

Michelle L. Israel
Associate Cooperative Education Coordinator, College of Science; Northeastern University, MS

Nathan Israeloff
Associate Professor, Physics; University of Illinois, Urbana-Champaign, PhD

Alexander Ivanov
Research Associate Professor, Barnett Institute; Russian Academy of Science, Institute of Bioorganic Chemistry (Moscow), PhD

Maura Daly Iversen
Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Harvard University, SD; Massachusetts General Hospital Institute of Health Professions, DPT

Julia Ivy
Associate Teaching Professor, International Business and Strategy; Lancaster University (United Kingdom), PhD

Denise Jackson
Associate Professor, Psychology; University of Pittsburgh, PhD

Ellen Jackson
Assistant Teaching Professor, English; Stanford University, MFA

Jason Jackson
Future Faculty Fellow, Political Science; Massachusetts Institute of Technology, PhD

Sarah Jackson
Assistant Professor, Communication Studies; University of Minnesota, PhD

William J. Jackson
Senior Cooperative Education Coordinator, College of Arts, Media and Design; University of Massachusetts, Boston, MEd

Michelle Jacobs
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; University of California, San Francisco, PharmD

Joshua R. Jacobson
Professor, Music; University of Cincinnati, DMA

Beverly Jaeger
Teaching Professor, Mechanical and Industrial Engineering; Northeastern University, PhD

Michael Jaeggli
Assistant Teaching Professor, Bioengineering; Clemson University, PhD

Nader Jalili
Professor, Mechanical and Industrial Engineering; University of Connecticut, PhD

Bogume Jang
Lecturer, Mathematics; Purdue University, PhD

Leon C. Janikian
Associate Professor, Music; University of Massachusetts, Amherst, MM

Torbjorn Jarbe
Research Professor, Pharmaceutical Sciences; University of Uppsala (Sweden), PhD

Solomon M. Jekel
Associate Professor, Mathematics; Dartmouth College, PhD

Qingying Jia
Research Assistant Professor, Chemistry and Chemical Biology; Illinois Institute of Technology, PhD

Benedict S. Jimenez
Associate Professor, Political Science; University of Illinois, Chicago, PhD

Holly Jimison
Professor of the Practice, Nursing and Computer and Information Science; Stanford University, PhD

Xiaoning Jin
Assistant Professor, Mechanical and Industrial Engineering; University of Michigan, PhD

Dinesh John
Assistant Professor, Health Sciences; University of Tennessee, PhD

Brooke Johnson
Assistant Cooperative Education Coordinator, D'Amore-McKim School of Business; Boston College, MEd

Vanessa D. Johnson
Associate Professor, Applied Psychology; Western Michigan University, EdD

Kimberly L. Jones
Associate Teaching Professor, International Affairs; Northeastern University, PhD

Rachel Jones
Associate Professor, Nursing; New York University, PhD

T. Anthony Jones
Associate Professor, Sociology and Anthropology; Princeton University, PhD

Dierdre Jordan
Associate Cooperative Education Coordinator, Bouvé College of Health Sciences; Northeastern University, MS

Yung Joon Jung
Associate Professor, Mechanical and Industrial Engineering; Rensselaer Polytechnic Institute, PhD

Jeffrey S. Juris
Associate Professor, Sociology and Anthropology; University of California, Berkeley, PhD

David R. Kaeli
Professor, Electrical and Computer Engineering; Rutgers University, PhD

Sallyann Kakas
Assistant Cooperative Education Coordinator, Finance; Northeastern University, BS

Jayant Kale
Professor and Philip R. McDonald Chair, Finance; University of Texas, Austin, PhD

Sagar V. Kamarthi
Associate Professor, Mechanical and Industrial Engineering; Pennsylvania State University, PhD

John Kane
Lecturer, Art + Design; Yale University, BA

Mary M. Kane
Senior Cooperative Education Coordinator, D'Amore-McKim School of Business; University of Massachusetts, Boston, MEd

Michael Kane
Assistant Professor, Civil and Environmental Engineering; University of Michigan, PhD

Carla Kaplan
Davis Distinguished Professor of American Literature, English and Women's, Gender, and Sexuality Studies; Northwestern University, PhD

Swastik Kar
Associate Professor, Physics; Indian Institute of Physics (India), PhD

Alireza Karimi
Assistant Professor, Mechanical and Industrial Engineering; Virginia Polytechnic Institute and State University, PhD

Alain S. Karma
College of Arts and Sciences Distinguished Professor, Physics; University of California, Santa Barbara, PhD

Ralph Katz
Professor, Entrepreneurship and Innovation; University of Pennsylvania, PhD

William D. Kay
Associate Professor, Political Science; Indiana University, PhD

Bret Keeling
Associate Teaching Professor, English; University of Washington, PhD

Maureen Kelleher
Associate Professor, Sociology and Anthropology; University of Missouri, Columbia, PhD

Karen P. Kelley
Senior Cooperative Education Coordinator, College of Engineering; Northeastern University, MEd

Ryann Kelley
Assistant Cooperative Education Coordinator, Finance; Northeastern University, MEd

Thomas Kelley
Lecturer, Physics; University of Minnesota, PhD

Kathleen Kelly
Professor, English; University of North Carolina, Chapel Hill, PhD

M. Whitney Kelting
Associate Professor, Philosophy and Religion; University of Wisconsin, Madison, PhD

Daniel D. Kennedy
Associate Professor, Journalism; Boston University, MLA

Aileen Kent Yates
Assistant Cooperative Education Coordinator, Computer and Information Science; University of Massachusetts, Amherst, BA

Richard M. Kesner
Lecturer, Supply Chain and Information Management; Stanford University, PhD

Heidi Kevoe Feldman
Associate Professor, Communication Studies; Rutgers University, PhD

Ban-An Khaw
Professor, Pharmaceutical Sciences; Boston College, PhD

Konstantin Khrapko
Professor, Biology and Pharmaceutical Sciences; Engelhardt Institute of Molecular Biology, Moscow (Russia), PhD

Ilham Khuri-Makdisi
Associate Professor, History; Harvard University, PhD

Sheri Kiami
Assistant Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Simmons College, DPT

Daniel Kim
Assistant Professor, Health Sciences; University of Toronto (Canada), MD; Harvard University, PhD

Jonghan Kim
Assistant Professor, Pharmaceutical Sciences; Ohio State University, PhD

Miso Kim
Assistant Professor, Art + Design; Carnegie Mellon University, PhD

Nancy S. Kim
Associate Professor, Psychology; Yale University, PhD

Tiffany Kim
Assistant Clinical Professor, Nursing; University of Pennsylvania, PhD

Yong-Bin Kim
Associate Professor, Electrical and Computer Engineering; Colorado State University, PhD

John Kimani
Assistant Teaching Professor, Electrical and Computer Engineering; University of Wisconsin, Milwaukee, PhD

David Kimbro
Assistant Professor, Marine and Environmental Sciences; University of California, Davis, PhD

Nancy Kindelan
Professor, Theatre; University of Wisconsin, Madison, PhD

Christopher K. King
Professor, Mathematics; Harvard University, PhD

Donald R. King
Associate Professor, Mathematics; Massachusetts Institute of Technology, PhD

Engin Kirda
Professor, Computer and Information Science and Electrical and Computer Engineering; Technical University of Vienna (Austria), PhD

Rein U. Kirss
Associate Professor, Chemistry and Chemical Biology; University of Wisconsin, Madison, PhD

William Kirtz
Associate Professor, Journalism; Columbia University, MS

Jennifer L. Kirwin
Associate Clinical Professor, Pharmacy and Health Systems Sciences; Northeastern University, PharmD

Alan M. Klein
Professor, Sociology and Anthropology; State University of New York, Buffalo, PhD

Sarah Klionsky
Assistant Cooperative Education Coordinator, College of Science; University of Wisconsin, Madison, MA

Kristian Kloeckl
Associate Professor, Art + Design; University of Venice (Italy), PhD

Thomas H. Koenig
Professor, Sociology and Anthropology; University of California, Santa Barbara, PhD

Mieczyslaw M. Kokar
Professor, Electrical and Computer Engineering; University of Wroclaw (Poland), PhD

Ying-Yee Kong
Associate Professor, Communication Sciences and Disorders; University of California, PhD

Tania Konry
Assistant Professor, Pharmaceutical Sciences; Ben Gurion University (Israel), PhD

Abigail N. Koppes
Assistant Professor, Chemical Engineering; Rensselaer Polytechnic Institute, PhD

Ryan Koppes
Assistant Professor, Chemical Engineering; Rensselaer Polytechnic Institute, PhD

Sarah Kostanski
Assistant Cooperative Education Coordinator, College of Engineering; Framingham State University, MS

Ilka Kostka
Assistant Teaching Professor, CPS International Programs; New York University, PhD

Christopher Kottke
Postdoctoral Teaching Associate, Mathematics; Massachusetts Institute of Technology, PhD

Harilaos Koutsopoulos
Professor, Civil and Environmental Engineering; Massachusetts Institute of Technology, PhD

Linda Kowalcky
Professor of the Practice, School of Public Policy and Urban Affairs; Johns Hopkins University, PhD

Gregory J. Kowalski
Associate Professor, Mechanical and Industrial Engineering; University of Wisconsin, Madison, PhD

Sergey Kravchenko
Professor, Physics; Institute of Solid State Physics (Russia), PhD

Dmitri Krioukov
Associate Professor, Physics; Old Dominion University, PhD

Ganesh Krishnamoorthy
Professor, Accounting; University of Southern California, PhD

Karthik Krishnan
Assistant Professor and Thomas Moore Faculty Fellow, Finance; Boston College, PhD

Louis J. Kruger
Associate Professor, Applied Psychology; Rutgers University, PsyD

Steven R. Kursh
Associate Academic Specialist, Finance; University of Pennsylvania, PhD

John E. Kwoka Jr.
Neal F. Finnegan Chair, Economics; University of Pennsylvania, PhD

Michelle Laboy
Assistant Professor, Architecture; University of Michigan, MArch

Jamie Ladge
Associate Professor, Management and Organizational Development; Boston College, PhD

Jay Laird
Assistant Teaching Professor, College of Professional Studies; Lesley University, MFA

Venkatraman Lakshmibai
Professor, Mathematics; Tata University (India), PhD

Charlotte Lam
Assistant Cooperative Education Coordinator, College of Science; California State University, Sacramento, MA

Joan Lamachia
Associate Cooperative Education Coordinator, College of Social Sciences and Humanities; Boston College, MEd

Arthur LaMan
Assistant Academic Specialist, College of Professional Studies; Northeastern University, MS

Anna Lamin
Associate Professor and Matthew Eagan Faculty Fellow, International Business and Strategy; University of Minnesota, PhD

Jason Lancaster
Associate Clinical Professor, Pharmacy and Health Systems Sciences; Massachusetts College of Pharmacy, PharmD

William Lancaster
Senior Lecturer, Communication Studies; Michigan State University, MA

Lucas J. Landherr
Associate Teaching Professor, Chemical Engineering; Cornell University, PhD

Henry W. Lane
Professor, International Business and Strategy; Harvard University, DBA

David Lang
Lecturer, Mathematics; Boston College, PhD; Northeastern University, PhD

Amy Lantinga
Associate Teaching Professor, College of Professional Studies; University of Tennessee, Knoxville, EdD

Paul LaPlante
Assistant Academic Specialist, World Languages Center; Brown University, MA

Philip Larese-Casanova
Associate Professor, Civil and Environmental Engineering; University of Iowa, PhD

Sonya L. Larrieux
Clinical Instructor, Physical Therapy, Movement, and Rehabilitation Sciences; Columbia University, MA

Barbara Larson
Assistant Academic Specialist, Management and Organizational Development; Harvard Business School, DBA

Elizabeth Larson
Assistant Cooperative Education Coordinator, D'Amore-McKim School of Business; Northeastern University, MBA

Kimberly Larson
Associate Teaching Professor, College of Professional Studies; Villanova University School of Law, JD; Drexel University, PhD

Felicia G. Lassk
Associate Professor, Marketing; University of South Florida, PhD

Amanda Reeser Lawrence
Associate Professor, Architecture; Harvard University, PhD

David M. Lazer
Professor, Political Science and Computer and Information Science; University of Michigan, Ann Arbor, PhD

Christina Lee
Assistant Professor, Applied Psychology; New York University, PhD

Cynthia Lee
Professor, Management and Organizational Development; University of Maryland, PhD

Doreen Lee
Associate Professor, Sociology and Anthropology; Cornell University, PhD

Jung H. Lee
Associate Professor, Philosophy and Religion; Brown University, PhD

Lee-Peng Lee
Lecturer, Mathematics; Massachusetts Institute of Technology, PhD

Yang W. Lee
Associate Professor, Supply Chain and Information Management; Massachusetts Institute of Technology, PhD

Carolyn W. T. Lee-Parsons
Associate Professor, Chemical Engineering and Chemistry and Chemical Biology; Cornell University, PhD

Miriam E. Leeser
Professor, Electrical and Computer Engineering; Cambridge University (United Kingdom), PhD

Laurel Leff
Associate Professor and Stotsky Professor of Jewish and Cultural Studies, Journalism; Yale University, MA

Lori H. Lefkovitz
Ruderman Professor, Jewish Studies and English; Brown University, PhD

Patrick Legros
Distinguished Professor, Economics; California Institute of Technology, PhD

Bradley M. Lehman
Professor, Electrical and Computer Engineering; Georgia Institute of Technology, PhD

Tricia Lenihan
Assistant Cooperative Education Coordinator, College of Engineering; Boston University, MEd

Robert Lentz
Assistant Academic Specialist, Entrepreneurship and Innovation; Babson College, MBA

Neal Lerner
Associate Professor, English; Boston University, EdD

Marina Leslie
Associate Professor, English; Yale University, PhD

Hanoch Lev-Ari
Professor, Electrical and Computer Engineering; Stanford University, PhD

Danielle Levac
Assistant Professor, Physical Therapy, Movement, and Rehabilitation Sciences; McMaster University (Canada), PhD

Tatyana Levchenko
Research Assistant Professor, Pharmaceutical Sciences; Academy of Medical Sciences Moscow (Russia), PhD

Yiannis A. Levendis
College of Engineering Distinguished Professor, Mechanical and Industrial Engineering; California Institute of Technology, PhD

Jack Levin
Irving S. and Betty Brudnick Distinguished Professor, Sociology and Anthropology; Boston University, PhD

Elinor Levine
Assistant Cooperative Education Coordinator, D'Amore-McKim School of Business; University of Massachusetts, Amherst, MEd

Kim Lewis
University Distinguished Professor, Biology; Moscow University (Russia), PhD

Laura H. Lewis
Cabot Professor, Chemical Engineering and Mechanical and Industrial Engineering; University of Texas, Austin, PhD

David J. Lewkowicz
Professor, Communication Sciences and Disorders; University of New York, PhD

Chieh Li
Associate Professor, Applied Psychology; University of Massachusetts, Amherst, EdD

Rui Li
Assistant Clinical Professor, Health Sciences; Baylor University, PhD

Dirk Libaers
Associate Professor, Entrepreneurship and Innovation; Georgia Institute of Technology, PhD

Robert Lieb
Professor, Supply Chain and Information Management; University of Maryland, DBA

Karl J. Lieberherr
Professor, Computer and Information Science; Eidgenössische Technische Hochschule Zürich (Switzerland), PhD

Karin N. Lifter
Professor, Applied Psychology; Columbia University, PhD

Xue Lin
Assistant Professor, Electrical and Computer Engineering; University of Southern California, PhD

Yingzi Lin
Associate Professor, Mechanical and Industrial Engineering; University of Saskatchewan (Canada), PhD

Alisa K. Lincoln
Professor, Health Sciences and Sociology and Anthropology; Columbia University, PhD

Margo Lindauer
Associate Teaching Professor, Health Sciences; Georgetown University Law Center, MS

John Lindhe
Lecturer, Mathematics; Northeastern University, MA

Charles Linshaw
Visiting Lecturer, Theatre; Columbia University, MFA

Gabor Lippner
Assistant Professor, Mathematics; Eotvos University (Hungary), PhD

James Lipsky
Associate Academic Specialist, World Languages Center; Boston University, MA

Heather Littlefield
Associate Teaching Professor, Linguistics; Boston University, PhD

Kelvin Liu
Associate Professor, Accounting; University of South Carolina, PhD

Yongmin Liu
Assistant Professor, Mechanical and Industrial Engineering and Electrical and Computer Engineering; University of California, Berkeley, PhD

Grigorios Livanis
Assistant Professor, International Business and Strategy; University of Florida, PhD

Ioannis Livanis
Associate Teaching Professor, International Affairs and Political Science; University of Florida, PhD

Carol Livermore
Associate Professor, Mechanical and Industrial Engineering; Harvard University, PhD

Mary Loeffelholz
Professor, English; Yale University, PhD

Martha Loftus
Assistant Teaching Professor, College of Professional Studies; Harvard University, EdD

Diomedes E. Logothetis
Professor, Pharmaceutical Sciences; Harvard University, PhD

Jane Lohmann
Associate Teaching Professor, College of Professional Studies; Harvard University, EdD

Mark Lomanno
Visiting Assistant Professor, Music; University of Texas, Austin, PhD

Fabrizio Lombardi
International Test Conference Professor, Electrical and Computer Engineering; University of London (United Kingdom), PhD

Marissa Lombardi
Assistant Teaching Professor, College of Professional Studies; Northeastern University, EdD

Guido Lopez
Associate Teaching Professor, College of Professional Studies; Northeastern University, PhD

Connie Lorette
Assistant Clinical Professor, Nursing; Boston College, PhD

Ralph H. Loring
Associate Professor, Pharmaceutical Sciences; Cornell University, PhD

Ivan Loseu
Associate Professor, Mathematics; Moscow State University (Russia), PhD

Kathleen Lotterhos
Assistant Professor, Marine and Environmental Sciences; Florida State University, PhD

Salim A. Lotuff III
Teaching Professor, Communication Studies; Northeastern University, MA

Deirdre Loughridge
Assistant Professor, Music; University of Pennsylvania, PhD

Tania Muino Loureiro
Assistant Academic Specialist, World Languages Center; University of Barcelona (Spain), MA

Jennifer O. Love
Associate Academic Specialist, Engineering; University of Iowa, MS

Timothy Love
Associate Professor, Architecture; Harvard University, MArch

William Lovely
Assistant Academic Specialist, International Business and Strategy; Northeastern University, DLP

Amy Lu
Assistant Professor, Communication Studies and Health Sciences; University of North Carolina, Chapel Hill, PhD

Katherine A. Luongo
Associate Professor, History; University of Michigan, Ann Arbor, PhD

Steven Lustig
Associate Professor, Chemical Engineering; Purdue University, PhD

David E. Luzzi
Professor, Mechanical and Industrial Engineering; Northwestern University, PhD

Spencer Lynn
Research Assistant Professor, Psychology; University of Arizona, PhD

Linlin Ma
Assistant Professor, Finance; Georgia State University, PhD

Patricia A. Mabrouk
Professor, Chemistry and Chemical Biology; Massachusetts Institute of Technology, PhD

Andrew Mackie
Assistant Clinical Professor, Physician Assistant Program; University of Nebraska, MS

Emanuele Macri
Associate Professor, Mathematics; SISSA (Italy), PhD

Jeanne Madden
Associate Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Harvard University, PhD

Kristin Madison
Professor, Health Sciences and Law; Stanford University, PhD

Tracy Magee
Assistant Clinical Professor, Nursing; Boston College, PhD

Bala Maheswaran
Teaching Professor, Engineering; Northeastern University, PhD

Elizabeth Mahler
Assistant Teaching Professor, College of Professional Studies; George Washington University, EdD

Luigia Gina Maiellaro
Senior Academic Specialist, World Languages Center; Russian State University for the Humanities (Russia), PhD

Lee Makowski
Professor, Bioengineering and Chemistry and Chemical Biology; Massachusetts Institute of Technology, PhD

Purnima Makris
Associate Professor, Electrical and Computer Engineering; Massachusetts Institute of Technology, PhD

Alexandros Makriyannis
Behrakis Trustee Chair in Pharmaceutical Biotechnology and University Distinguished Professor, Pharmaceutical Sciences and Chemistry and Chemical Biology; University of Kansas, PhD

Michael Malamas
Research Associate Professor, Pharmaceutical Sciences and Chemistry and Chemical Biology; University of Pennsylvania, PhD

Shiti Malhotra
Lecturer, Linguistics; University of Maryland, PhD

Veronika Maliborska
Assistant Teaching Professor, College of Professional Studies; Purdue University, PhD

Mikhail Malioutov
Professor, Mathematics; Moscow State University (Russia), PhD

Andrew Mall
Visiting Assistant Teaching Professor, Music; University of Chicago, PhD

Craig E. Maloney
Associate Professor, Mechanical and Industrial Engineering; University of California, Santa Barbara, PhD

Roman Manetsch
Associate Professor, Chemistry and Chemical Biology and Pharmaceutical Sciences; University of Basel (Switzerland), PhD

Justin Manjourides
Assistant Professor, Health Sciences; Harvard University, PhD

Emily Mann
Teaching Professor, Human Services; University of Wisconsin, Madison, PhD

James M. Manning
Professor, Biology; Tufts University, PhD

Peter K. Manning
Elmer V. H. and Eileen M. Brooks Trustee Professor, Criminology and Criminal Justice; Duke University, PhD

Moira C. Mannix
Associate Cooperative Education Coordinator, Bouvé College of Health Sciences; Columbia University, MA

Peter Manolios
Professor, Computer and Information Science; University of Texas, Austin, PhD

Valentina Marano
Assistant Professor, International Business and Strategy; University of South Carolina, PhD

Edwin Marengo
Associate Professor, Electrical and Computer Engineering; Northeastern University, PhD

Donald G. Margotta
Associate Professor, Finance; University of North Carolina, Chapel Hill, PhD

Alina Marian
Associate Professor, Mathematics; Harvard University, PhD

Tucker Marion
Associate Professor and Altschuler Research Fellow, Entrepreneurship and Innovation; Pennsylvania State University, PhD

Robert S. Markiewicz
Professor, Physics; University of California, Berkeley, PhD

Alycia Markowski
Associate Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Mindy Marks
Associate Professor, Economics; Washington University, PhD

Stacy Marsella
Professor, Computer and Information Science and Psychology; Rutgers University, PhD

Ineke Haen Marshall
Professor, Sociology and Anthropology and Criminology and Criminal Justice; Bowling Green State University, PhD

Dayna L. Martinez
Assistant Teaching Professor, Mechanical and Industrial Engineering; University of South Florida, Tampa, PhD

Ramiro Martinez Jr.
Professor, Criminology and Criminal Justice and Sociology and Anthropology; Ohio State University, PhD

José Angel Martinez-Lorenzo
Assistant Professor, Mechanical and Industrial Engineering and Electrical and Computer Engineering; Universidad de Vigo (Spain), PhD

Ivan Martino
Visiting Postdoctoral Teaching Associate, Mathematics; Stockholm University (Sweden), PhD

Mauro Martino
Assistant Professor, Art + Design and Public Policy and Urban Affairs; Polytechnic University of Milan (Italy), PhD

Alexander Martsinkovsky
Associate Professor, Mathematics; Brandeis University, PhD

Emanuel J. Mason
Professor, Applied Psychology; Temple University, EdD

David Massey
Professor, Mathematics; Duke University, PhD

Jude Mathews
Assistant Teaching Professor, Chemistry and Chemical Biology; Clemson University, PhD

Kristen Mathieu Gonzalez
Clinical Instructor, Nursing; University of Phoenix, MS

Thomas M. Matta
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; Xavier University of Lousiana, PharmD

Samuel J. Matthews
Associate Professor, Pharmacy and Health Systems Sciences; University of Minnesota, PharmD

Gail Matthews-DeNatale
Assistant Teaching Professor, College of Professional Studies; Indiana University, Bloomington, PhD

Carla Mattos
Professor, Chemistry and Chemical Biology; Massachusetts Institute of Technology, PhD

Lucy Maulsby
Associate Professor, Architecture; Columbia University, PhD

Ernest Mauristhene
Associate Cooperative Education Coordinator, D'Amore-McKim School of Business; Hardin-Simmons University, MBA

William G. Mayer
Professor, Political Science; Harvard University, PhD

Mary Mayville
Assistant Clinical Professor, Nursing; Northeastern University, DNP

Dori P. Mazor
Assistant Cooperative Education Coordinator, College of Arts, Media and Design; Brandeis University, MBA

Laurie McCadden
Clinical Instructor, Nursing; University of Massachusetts, Lowell, MSN

Daniel J. McCarthy
McKim and D'Amore Distinguished Professor of Global Management and Innovation, Entrepreneurship and Innovation; Harvard University, DBA

Paulette McCarty
Assistant Academic Specialist, Management and Organizational Development; University of Tennessee, PhD

Jane McCool
Assistant Clinical Professor, Nursing; University of Rhode Island, PhD

Eileen L. McDonagh
Professor, Political Science; Harvard University, PhD

Ann McDonald
Associate Professor, Art + Design; Yale University, MFA

Matthew McDonald
Associate Professor, Music; Yale University, PhD

Melissa McElligott
Assistant Teaching Professor, Biology; Northeastern University, PhD

Seamus McGovern
Lecturer, Supply Chain and Information Management; Northeastern University, PhD

Nicol E. McGruer
Professor, Electrical and Computer Engineering; Michigan State University, PhD

Jean McGuire
Professor of the Practice, Health Sciences; Brandeis University, PhD

Brendan McLellan
Postdoctoral Teaching Associate, Mathematics; University of Toronto (Canada), PhD

Cristine McMartin-Miller
Associate Teaching Professor, CPS International Programs; Purdue University, PhD

Joseph McNabb
Professor of the Practice, College of Professional Studies; Northeastern University, PhD

Robert C. McOwen
Professor, Mathematics; University of California, Berkeley, PhD

Frances Nelson McSherry
Teaching Professor, Theatre; New York University, MFA

Thomas L. Meade
Postdoctoral Teaching Associate, Communication Studies; University of Alabama, PhD

Isabel Meirelles
Associate Professor, Art + Design; Massachusetts College of Art, MFA

Emanuel S. Melachrinoudis
Associate Professor, Mechanical and Industrial Engineering; University of Massachusetts, Amherst, PhD

Waleed Meleis
Associate Professor, Electrical and Computer Engineering; University of Michigan, PhD

Susan L. Mello
Assistant Professor, Communication Studies; University of Pennsylvania, PhD

Tina Mello
Assistant Cooperative Education Coordinator, College of Science; Boston College, MA

Richard H. Melloni Jr.
Professor, Psychology; University of Massachusetts Medical Center, PhD

Tommaso Melodia
Associate Professor, Electrical and Computer Engineering; Georgia Institute of Technology, PhD

Latika Menon
Associate Professor, Physics; Tata Institute of Fundamental Research, Bombay (India), PhD

David Merry
Associate Cooperative Education Coordinator, Cooperative Education; University of Iowa, MA

Hameed Metghalchi
Professor, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, ScD

Marc H. Meyer
Robert J. Shillman Professor of Entrepreneurship and Matthews Distinguished University Professor, Entrepreneurship and Innovation; Massachusetts Institute of Technology, PhD

Michael C. Meyer
Lecturer, Philosophy and Religion; Boston University, PhD

Ningfang Mi
Associate Professor, Electrical and Computer Engineering; University of Texas, Dallas, MS

Dean Michael
Assistant Teaching Professor, College of Professional Studies; Columbia University, PhD

Srboljub Mijailovich
Research Professor, Chemistry and Chemical Biology; Massachusetts Institute of Technology, PhD

Loiza Miles
Assistant Academic Specialist, World Languages Center; Sorbonne University (France), MA

William F. S. Miles
Professor, Political Science; Tufts University, PhD

Danielle M. Miller
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; Northeastern University, PharmD

Dennis H. Miller
Professor, Music; Columbia University, DMA

Edward Miller
Assistant Teaching Professor, CPS International Programs; Boston College, PhD

Gregory Miller
Associate Professor, Pharmaceutical Sciences; Mount Sinai School of Medicine, PhD

Joanne L. Miller
Matthews Distinguished University Professor, Psychology; University of Minnesota, PhD

Matthew Miller
Professor, Health Sciences; Yale University, MD; Harvard University, ScD

Sara Minard
Assistant Academic Specialist, Entrepreneurship and Innovation; Institute d'Etudes Politiques (France), PhD

Ennio Mingolla
Professor, Communication Sciences and Disorders; University of Connecticut, PhD

Marilyn L. Minus
Associate Professor, Mechanical and Industrial Engineering; Georgia Institute of Technology, PhD

Alan Mislove
Associate Professor, Computer and Information Science; Rice University, PhD

Cheryl Mitteness
Acadmic Specialist, Entrepreneurship and Innovation; University of Louisville, PhD

Nancy Mizzoni
Clinical Instructor, Nursing; Northeastern University, MS

Anahit Mkrtchyan
Assistant Professor, Finance; Pennsylvania State University, PhD

Vallentine Moghadam
Professor, Sociology and Anthropology and International Affairs; American University, PhD

Shan Mohammed
Associate Professor, Health Sciences; Case Western Reserve University, MD

Changiz Mohiyeddini
Associate Professor, Applied Psychology; University of Trier (Germany), PhD

Beth Molnar
Associate Professor, Health Sciences; Harvard University, ScD

James Monaghan
Assistant Professor, Biology; University of Kentucky, PhD

Katelyn Monaghan
Assistant Clinical Professor, Communication Sciences and Disorders; A.T. Still University School of Health Sciences - Mesa, AuD

Susan F. Montgomery
Senior Academic Specialist, Entrepreneurship and Innovation and Law; Northeastern University, JD

Swapnil Moon
Assistant Teaching Professor, Mechanical and Industrial Engineering; New Jersey Institute of Technology, PhD

Robert M. Mooradian
Professor and Harding Research Professor, Finance; University of Pennsylvania, PhD

Rebekah Moore
Assistant Professor, Accounting; University of Tennessee, PhD

Enrique Moreno
Senior Lecturer, Physics; Universidad Nacional de La Plata (Argentina), PhD

Jessica Moreno
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; University of Michigan, PharmD

Kimberly Moreno
Associate Professor and Harold A. Mock Professor, Accounting; University of Massachusetts, Amherst, PhD

Joanne Morreale
Associate Professor, Media and Screen Studies; Temple University, PhD

Kristen Morse
Assistant Cooperative Education Coordinator, Bouvé College of Health Sciences; Ithaca College, DPT

Hossein Mosallaei
Associate Professor, Electrical and Computer Engineering; University of California, Los Angeles, PhD

Edward V. Moss
Assistant Teaching Professor, English; Emerson College, MFA

Jeanine K Mount
Professor of the Practice, Pharmacy and Health Systems Sciences and Health Sciences; Purdue University, PhD

Lorraine Ann Mountain
Senior Cooperative Education Coordinator, College of Engineering; Tufts University, MS

Amy Mueller
Assistant Professor, Civil and Environmental Engineering and Marine and Environmental Sciences; Massachusetts Institute of Technology, PhD

Sinan Muftu
Professor, Mechanical and Industrial Engineering; University of Rochester, PhD

Sanjeev Mukerjee
Professor, Chemistry and Chemical Biology; Texas AM University, PhD

Jay Mulki
Associate Professor, Marketing; University of South Florida, PhD

Patrick R. Mullen
Associate Professor, English; University of Pittsburgh, PhD

Kellianne Murphy
Senior Cooperative Education Coordinator, College of Arts, Media and Design; Northeastern University, MA

Lauren A. Murphy
Assistant Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Portland State University, PhD

Robert Murray
Assistant Academic Specialist, Supply Chain and Information Management; Harvard Business School, MBA

Shashi K. Murthy
Associate Professor, Chemical Engineering; Massachusetts Institute of Technology, PhD

Cecelia Musselman
Associate Teaching Professor, English; Columbia University, PhD

Shakir Mustafa
Senior Academic Specialist, World Languages Center; Boston University, PhD

Andrew Myers
Assistant Professor, Civil and Environmental Engineering; Stanford University, PhD

David Myers
Associate Teaching Professor, Finance; University of Washington, PhD

Laura Mylott
Clinical Professor, Nursing; Boston College, PhD

Franklin Naarendorp
Associate Professor, Psychology; City University of New York, PhD

Nada Naji
Lecturer, Computer and Information Science; University of Neuchatel (Switzerland), PhD

Thomas K. Nakayama
Professor, Communication Studies; University of Iowa, PhD

Laurie A. Nardone
Associate Teaching Professor, English; Emory University, PhD

Uichiro Narusawa
Associate Professor, Mechanical and Industrial Engineering; University of Michigan, PhD

Pran Nath
Matthews Distinguished University Professor, Physics; Stanford University, PhD

Hamid Nayeb-Hashemi
Professor, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, PhD

Brent Nelson
Associate Professor, Physics; University of California, Berkeley, PhD

Carl W. Nelson
Associate Professor, International Business and Strategy; University of Manchester (United Kingdom), PhD

Laura Nelson
Assistant Professor, Sociology and Anthropology; University of California, Berkeley, PhD

Van Nguyen
Postdoctoral Teaching Associate, Mathematics; Texas AM University, PhD

Sandy Nickel
Assistant Teaching Professor, College of Professional Studies; University of Iowa, PhD

Mark J. Niedre
Associate Professor, Electrical and Computer Engineering and Bioengineering; University of Toronto (Canada), PhD

Spyridon Nikas
Research Associate Professor, Pharmaceutical Sciences; Aristotle University (Greece), PhD

Matthew Nippins
Assistant Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Massachusetts General Hospital Institute of Health Professions, DPT

Matthew C Nisbet
Associate Professor, Communication Studies; Cornell University, PhD

Cristina Nita-Rotaru
Professor, Computer and Information Science; Johns Hopkins University, PhD

Daniel R. Noemi Voionmaa
Associate Professor, History; Yale University, PhD

Alison Nogueira
Associate Cooperative Education Coordinator, College of Engineering; Suffolk University, MEd

David Nolan
Associate Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Massachusetts General Hospital Institute of Health Professions, DPT

Kimberly Nolan
Assistant Teaching Professor, College of Professional Studies; University of Vermont, EdD

Carey Noland
Associate Professor, Communication Studies; Ohio University, PhD

Ellen Noonan
Associate Teaching Professor, English; Emerson College, MFA

Matthew P. Noonan
Associate Teaching Professor, English; Massachusetts College of Art, MFA

Guevara Noubir
Professor, Computer and Information Science; Swiss Federal Institute of Technology, Lausanne (Switzerland), PhD

Welville B. Nowak
Senior Research Scientist, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, PhD

Gilbert Nyaga
Associate Professor and Joe Dichiacchio Faculty Fellow, Supply Chain and Information Management; Michigan State University, PhD

Jessica Oakes
Assistant Professor, Bioengineering; University of California, San Diego, PhD

Antonio Ocampo-Guzman
Associate Professor, Theatre; York University (Canada), MFA

Lydia Odgen
Associate Teaching Professor, Human Services; Columbia University, PhD

Curtis Odom
Visiting Lecturer, Management and Organizational Development; Pepperdine University, EdD

Dietmar Offenhuber
Assistant Professor, Art + Design; Massachusetts Institute of Technology, PhD

Marvin Onabajo
Assistant Professor, Electrical and Computer Engineering; Texas AM University, PhD

Kay Onan
Associate Professor, Chemistry and Chemical Biology; Duke University, PhD

Mary Jo Ondrechen
Professor, Chemistry and Chemical Biology; Northwestern University, PhD

Annalisa Onnis-Hayden
Associate Teaching Professor, Civil and Environmental Engineering; University of Cagliari (Italy), PhD

Stephen Onu
Assistant Academic Specialist, College of Professional Studies; University of Phoenix, DBA

Toyoko Orimoto
Assistant Professor, Physics; University of California, Berkeley, PhD

Elika Ortega Guzman
Assistant Professor, Languages, Literatures, and Cultures; University of Western Ontario (Canada), PhD

Oleksiy Osiyevskyy
Assistant Professor, Entrepreneurship and Innovation; University of Calgary (Canada), PhD

Jacek Ossowski
Lecturer, Computer and Information Science; New York University, PhD

Sarah Ostadabbas
Assistant Professor, Electrical and Computer Engineering; University of Texas, Dallas, PhD

Timothy Ouillette
Assistant Teaching Professor, Communication Studies; Art Institute of Boston, MFA

Oyindasola Oyelaran
Associate Teaching Professor, Chemistry and Chemical Biology; Harvard University, PhD

Yusuf Ozbek
Assistant Teaching Professor, Graduate School of Engineering; Northeastern University, PhD

Dan O'Brien
Assistant Professor, Public Policy and Urban Affairs and Criminology and Criminal Justice; Binghamton University, PhD

Sean O'Connell
Assistant Academic Specialist, College of Professional Studies; University of Massachusetts, Boston, MA

Catherine O'Connor
Clinical Instructor, Nursing; Boston College, MS

George A. O'Doherty
Professor, Chemistry and Chemical Biology; Ohio State University, PhD

Russ O'Haver
Senior Academic Specialist, Accounting; University of New York, PhD

Peggy L. O'Kelly
Senior Lecturer, Accounting; University of Michigan, MBA

Donald M. O'Malley
Associate Professor, Biology; Harvard University, PhD

Therese M. O'Neil-Pirozzi
Associate Professor, Communication Sciences and Disorders; Boston University, ScD

Taskin Padir
Associate Professor, Electrical and Computer Engineering; Purdue University, PhD

Robert Painter
Lecturer, Linguistics; State University of New York, Buffalo, PhD

Himlona Palikhe
Assistant Teaching Professor, Graduate School of Engineering; Texas Tech University, PhD

Kwamina Panford
Associate Professor, African-American Studies; Northeastern University, PhD

Coleen C. Pantalone
Associate Professor, Finance; Iowa State University, PhD

Jeremy Papadopoulos
Assistant Teaching Professor, Mechanical and Industrial Engineering; Massachusetts Institute of Technology, PhD

Harikrishnan Parameswaran
Assistant Professor, Bioengineering; Boston University, PhD

Serena Parekh McGushin
Associate Professor, Philosophy and Religion; Boston College, PhD

Andrea Parker
Assistant Professor, Computer and Information Science and Health Sciences; Georgia Institute of Technology, PhD

Christopher M. Parsons
Assistant Professor, History; University of Toronto (Canada), PhD

Nikos Passas
Professor, Criminology and Criminal Justice; University of Edinburgh (Scotland), PhD

Rupal Patel
Professor, Communication Sciences and Disorders and Computer and Information Science; University of Toronto (Canada), PhD

Dipu Patel-Junankar
Assistant Clinical Professor, Physician Assistant Program; University of Nebraska, MPAS

Mark Patterson
Professor, Marine and Environmental Sciences and Civil and Environmental Engineering; Harvard University, PhD

Misha Pavel
Professor of the Practice, Computer and Information Science and Health Sciences; New York University, PhD

Nancy Pawlyshyn
Assistant Teaching Professor, College of Professional Studies; Capella University, PhD

Celia Pearce
Associate Professor, Game Design; University of the Arts London (United Kingdom), PhD

Neal Pearlmutter
Associate Professor, Psychology; Massachusetts Institute of Technology, PhD

Melissa Pearson
Assistant Teaching Professor, English; University of South Carolina, PhD

Melissa Peiken
Associate Cooperative Education Coordinator, Computer and Information Science; Emerson College, MEd

Russell Pensyl
Professor, Art + Design; Western Michigan University, MFA

Pablo Perez Ramos
Visiting Assistant Professor, Architecture; Harvard University, MLA

Natalie Perry
Assistant Teaching Professor, College of Professional Studies; University of Virginia, PhD

Stuart S. Peterfreund
Professor, English; University of Washington, PhD

Courtney Pfluger
Assistant Teaching Professor, Engineering; Northeastern University, PhD

Susan E. Picillo
Senior Lecturer, Communication Studies; Cambridge College, MEd

Sara Picklesmier
Postdoctoral Teaching Associate, Communication Studies; University of Connecticut, PhD

Pamela Pietrucci
Postdoctoral Teaching Associate, Communication Studies; University of Washington, PhD

Ameet Pinto
Assistant Professor, Civil and Environmental Engineering; Virginia Polytechnic Institute and State University, PhD

Jacqueline M. Piret
Associate Professor, Biology; Massachusetts Institute of Technology, PhD

Jennifer Pirri
Assistant Teaching Professor, Behavioral Neuroscience; University of Massachusetts Medical School, PhD

Steven D Pizer
Associate Professor, Pharmacy and Health Systems Sciences; Boston College, PhD

Harlan D. Platt
Professor, Finance; University of Michigan, PhD

Marjorie Platt
Professor, Accounting; University of Michigan, PhD

Robert Platt Jr.
Assistant Professor, Computer and Information Science; University of Massachusetts, Amherst, PhD

Peter Plourde
Assistant Academic Specialist, College of Professional Studies; University of Massachusetts, Lowell, MS

Elizabeth J. Podlaha-Murphy
Professor, Chemical Engineering; Columbia University, PhD

Mya Poe
Assistant Professor, English; University of Massachusetts, Amherst, PhD

Hermine Poghosyan
Assistant Professor, Nursing; University of Massachusetts Boston, PhD

Uta G. Poiger
Professor, History; Brown University, PhD

Ann Polcari
Associate Clinical Professor, Nursing; Boston College, PhD

Michael Pollastri
Associate Professor, Chemistry and Chemical Biology; Brown University, PhD

Marius Popescu
Visiting Assistant Professor, Finance; Virginia Polytechnic Institute and State University, PhD

Hilary Poriss
Associate Professor, Music; University of Chicago, PhD

Richard D. Porter
Professor, Mathematics; Yale University, PhD

Veronica L. Porter
Associate Professor, Cooperative Education, College of Science; Northeastern University, MEd

John H. Portz
Professor, Political Science; University of Wisconsin, Madison, PhD

David Potter
Associate Cooperative Education Coordinator, College of Engineering; Northeastern University, MSEE

Mary-Susan Potts-Santone
Associate Teaching Professor, Biology; University of New Hampshire, PhD

Karen Pounds
Assistant Clinical Professor, Nursing; University of Rhode Island, PhD

Michael J. Power
Lecturer, Supply Chain and Information Management; Northeastern University, MBA

Susan Powers-Lee
Professor, Biology; University of California, Berkeley, PhD

Robert Prior
Associate Teaching Professor, College of Professional Studies; Nova Southeastern University, EdD

Mark Prokosch
Lecturer, Psychology; University of California, Davis, PhD

Sheila M. Puffer
Professor and University Distinguished Professor, International Business and Strategy; University of California, Berkeley, PhD

Karen Quigley
Research Associate Professor, Psychology; Ohio State University, PhD

William G. Quill
Associate Professor, Applied Psychology; University of Massachusetts, Amherst, PhD

Daniel F. Quinn
Teaching Professor, Psychology; Northeastern University, PhD

Samuel Rabino
Professor, Marketing; New York University, PhD

Gordana Rabrenovic
Associate Professor, Sociology and Anthropology; State University of New York, Albany, PhD

Joseph A. Raelin
Professor and Asa S. Knowles Chair of Practice-Oriented Education, Management and Organizational Development; State University of New York, Buffalo, PhD

Rajmohan Rajaraman
Professor, Computer and Information Science; University of Texas, Austin, PhD

Ravi Ramamurti
Distinguished Chair Professor, International Business and Strategy; Harvard University, DBA

Valeria Ramdin
Clinical Instructor, Nursing; Northeastern University, PhD

Janet H. Randall
Professor, English; University of Massachusetts, Amherst, PhD

Carey M. Rappaport
College of Engineering Distinguished Professor, Electrical and Computer Engineering; Massachusetts Institute of Technology, ScD

Richard A. Rasala
Professor, Computer and Information Science; Harvard University, PhD

Andrea Raynor
Teaching Professor, Art + Design; School of Visual Arts, MFA

Joseph Reagle
Assistant Professor, Communication Studies; New York University, PhD

Debra J. Reid
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; Northeastern University, PharmD

Imke C. Reimers
Assistant Professor, Economics; University of Minnesota, PhD

Karen Reiss Medwed
Assistant Teaching Professor, College of Professional Studies; New York University, PhD

Marketa Rejtarova
Assistant Clinical Professor, Nursing; Massachusetts General Hospital Institute of Health Professions, DNP

Alessandra Renzi
Assistant Professor, Art + Design; University of Toronto (Canada), PhD

John R. Reynolds
Professor, Pharmacy and Health Systems Sciences; Duquesne University, PharmD

Karl Reynolds
Associate Teaching Professor, CPS International Programs; University of Washington, PhD

Mahtab Rezvani
Assistant Academic Specialist, CPS International Programs; California State University, Los Angeles, MA

Lesley Ricci
Visiting Lecturer, Psychology; Northeastern University, PhD

Christopher Richardson
Lecturer, Biology; Boston University, PhD

Milda Richardson
Lecturer, Art + Design; Boston University, PhD

Megan Richmond
Assistant Cooperative Education Coordinator, D'Amore-McKim School of Business; Boston College, MEd

Janet S. Rico
Associate Clinical Professor, Nursing; Northeastern University, PhD

Mirek Riedewald
Associate Professor, Computer and Information Science; University of California, Santa Barbara, PhD

Christoph Riedl
Assistant Professor, Supply Chain and Information Management and Computer and Information Science; Technische Universität München (Germany), PhD

Justin Ries
Associate Professor, Marine and Environmental Sciences; Johns Hopkins University, PhD

Matteo Rinaldi
Assistant Professor, Electrical and Computer Engineering; University of Pennsylvania, PhD

Christie Rizzo
Assistant Professor, Applied Psychology; University of Southern California, Los Angeles, PhD

Christina Roberts
Assistant Cooperative Education Coordinator, D'Amore-McKim School of Business; Simmons College, MBA

Susan J. Roberts
Professor, Nursing; Boston University, DNSc

Christopher J. Robertson
Professor, International Business and Strategy; Florida State University, PhD

Craig M. Robertson
Assistant Professor, Media and Screen Studies; University of Illinois, Urbana-Champaign, PhD

William Robertson
Assistant Professor, Computer and Information Science and Electrical and Computer Engineering; University of California, Santa Barbara, PhD

Cordula Robinson
Associate Teaching Professor, College of Professional Studies; University College London (United Kingdom), PhD

Harlow L. Robinson
Matthews Distinguished University Professor, History; University of California, Berkeley, PhD

Holbrook C. Robinson
Associate Professor, Languages, Literatures, and Cultures; Harvard University, PhD

Tracy L. Robinson Wood
Professor, Applied Psychology; Harvard University, EdD

Brian Robison
Assistant Teaching Professor, Music; Cornell University, DMA

David A. Rochefort
College of Arts and Sciences Distinguished Professor, Political Science; Brown University, PhD

Rachel Rodgers
Associate Professor, Applied Psychology; Université de Toulouse-Le Mirail (France), PhD

Kirsten Rodine Hardy
Associate Professor, Political Science; University of California, Berkeley, PhD

Bruce Ronkin
Professor, Music; University of Maryland, DMA

Tayla Rose
Visiting Assistant Clinical Professor, Pharmacy and Health Systems Sciences; University of Connecticut, PharmD

Karyn Rosen
Associate Cooperative Education Coordinator, Computer and Information Science; Salem State College, MA

Rebeca B. Rosengaus
Associate Professor, Marine and Environmental Sciences; Boston University, PhD

James R. Ross
Associate Professor, Journalism; American University, MA

Martin E. Ross
Associate Professor, Marine and Environmental Sciences; University of Idaho, PhD

Alexandra Roth
Associate Academic Specialist, International Business and Strategy; University of Frankfurt (Germany), PhD

Amit K. Roy
Assistant Teaching Professor, Chemical Engineering; University of Calcutta (India), PhD

Jeffrey W. Ruberti
Professor, Bioengineering; Tulane University, PhD

Michael Ruff
Assistant Teaching Professor, Accounting; Bentley University, PhD

Timothy J. Rupert
Professor, Accounting; Pennsylvania State University, PhD

Ivan Rupnik
Associate Professor, Architecture; Harvard University, MArch

Bruce Russell
Associate Academic Specialist, Supply Chain and Information Management; National University of Ireland (Ireland), PhD

Matthais Ruth
Professor, Public Policy and Urban Affairs and Civil and Environmental Engineering; University of Illinois, Urbana-Champaign, PhD

Jane Saczynski
Associate Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Pennsylvania State University, EdD

Hanai A. Sadaka
Lecturer, Mathematics; Northeastern University, PhD

J. Timothy Sage
Associate Professor, Physics; University of Illinois, Urbana-Champaign, PhD

Vinod Sahney
Professor, Mechanical and Industrial Engineering; University of Wisconsin, Madison, PhD

Masoud Salehi
Associate Professor, Electrical and Computer Engineering; Stanford University, PhD

Carmel Salhi
Assistant Professor, Health Sciences; Harvard University, ScD

William Sanchez
Associate Professor, Applied Psychology; Boston University, PhD

Nada Sanders
Distinguished Professor of Supply Chain Management, Supply Chain and Information Management; Ohio State University, PhD

Tova Sanders
Associate Teaching Professor, College of Professional Studies; George Washington University, EdD

Ronald L. Sandler
Professor, Philosophy and Religion; University of Wisconsin, Madison, PhD

Billye Sankofa-Waters
Associate Teaching Professor, College of Professional Studies; University of North Carolina, Chapel Hill, PhD

Ravi Sarathy
Professor, International Business and Strategy; University of Michigan, PhD

Linda Sarkisian
Assistant Cooperative Education Coordinator, D'Amore-McKim School of Business; Lynn University, MBA

Jennifer I. Sartori
Assistant Academic Specialist, Jewish Studies; Haverford College of Pennsylvania, PhD

Mehrdad Sasani-Kolori
Associate Professor, Civil and Environmental Engineering; University of California, Berkeley, PhD

Alicia Sasser Modestino
Associate Professor, Public Policy and Urban Affairs and Economics; Harvard University, PhD

Cinthia Satornino
Assistant Professor, Marketing; Florida State University, PhD

Behrooz (Barry) Satvat
Associate Teaching Professor, Chemical Engineering; Massachusetts Institute of Technology, ScD

Daniel Saulnier
Associate Cooperative Education Coordinator, College of Engineering; Babson College, MBA

Kevin Scanlon
Professor of the Practice, Entrepreneurship and Innovation; University of London (United Kingdom), PhD

Carmen Sceppa
Professor, Health Sciences; Francisco Marroquin University (Guatemala), MD; Tufts University, PhD

Martin Schedlbauer
Associate Clinical Professor, Computer and Information Science; University of Massachusetts, PhD

Gunar Schirner
Associate Professor, Electrical and Computer Engineering; University of California, Irvine, PhD

Ralf W. Schlosser
Professor, Communication Sciences and Disorders; Purdue University, PhD

Benjamin M. Schmidt
Assistant Professor, History; Princeton University, PhD

Paul Schreyer
Assistant Academic Specialist, World Languages Center; Western Maryland College, MEd

Alan Schroeder
Professor, Journalism; Harvard University, MPA

Egon Schulte
Professor, Mathematics; University of Dortmund (Germany), PhD

Kathryn Schulte Grahame
Associate Teaching Professor, Engineering; Columbia University, PhD

Joseph Schwartz
Assistant Teaching Professor, Communication Studies; University of Iowa, PhD

Martin Schwarz
Associate Professor, Mathematics; Courant Institute, PhD

Douglass Scott
Senior Lecturer, Art + Design; Yale University, MFA

Frank (Alex) Scott
Assistant Professor, Supply Chain and Information Management; Pennsylvania State University, PhD

Steven Scyphers
Assistant Professor, Marine and Environmental Sciences; University of South Alabama, PhD

Magy Seif El-Nasr
Associate Professor, Game Design; Northwestern University, PhD

Laura Senier
Assistant Professor, Sociology and Anthropology and Health Sciences; Brown University, PhD

Sumi Seo
Lecturer, Mathematics; University of Missouri, Columbia, PhD

Susan M. Setta
Associate Professor, Philosophy and Religion; Pennsylvania State University, PhD

Bahram Shafai
Professor, Electrical and Computer Engineering; George Washington University, ScD

Jayant M. Shah
Professor, Mathematics; Massachusetts Institute of Technology, PhD

Rebecca Shansky
Assistant Professor, Psychology; Yale University, PhD

Harvey D. Shapiro
Associate Clinical Professor, Education; Hebrew Union College, PhD

Nancy H. Sharby
Associate Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

William Sharp
Lecturer, Psychology; Boston Graduate School of Psychoanalysis, PhD

Gavin M. Shatkin
Associate Professor, Public Policy and Urban Affairs and Architecture; Rutgers University, PhD

Dennis R. Shaughnessy
Senior Academic Specialist, Entrepreneurship and Innovation; University of Maryland, JD

Margaret Shea
Associate Cooperative Education Coordinator, D'Amore-McKim School of Business; Boston University, BLS

Thomas C. Sheahan
Professor, Civil and Environmental Engineering; Massachusetts Institute of Technology, ScD

Sandra Shefelbine
Associate Professor, Mechanical and Industrial Engineering and Bioengineering; Stanford University, PhD

Paxton Sheldahl
Assistant Teaching Professor, Architecture; Harvard University, MArch

Eliot Sherman
Senior Lecturer, Finance; Bentley College, MST

H. David Sherman
Professor, Accounting; Harvard University, DBA

Amit Shesh
Associate Teaching Professor, Computer and Information Science; University of Minnesota, Twin Cities, PhD

Shiaoming Shi
Assistant Teaching Professor, Bioengineering; University of Pittsburgh, PhD

Craig Shillaber
Assistant Teaching Professor, Civil and Environmental Engineering; Virginia Polytechnic Institute and State University, MS

Olin Shivers
Professor, Computer and Information Science; Carnegie Mellon University, PhD

Mariya Shiyko
Assistant Professor, Applied Psychology; City University of New York, PhD

Aatmesh Shrivastava
Assistant Professor, Electrical and Computer Engineering; University of Virginia, Charlottesville, PhD

Brandon Sichling
Visiting Lecturer, Art + Design; Emerson College, MFA

Susan F. Sieloff
Senior Lecturer, Marketing; University of Michigan, MBA

Robert Sikes
Associate Professor, Physical Therapy, Movement, and Rehabilitation Sciences; University of Texas, Houston, PhD

Michael B. Silevitch
Robert Black Professor of Engineering and College of Engineering Distinguished Professor, Electrical and Computer Engineering; Northeastern University, PhD

Peter J. Simon
Teaching Professor, Economics; Northern Illinois University, PhD

Simon I. Singer
Professor, Criminology and Criminal Justice; University of Pennsylvania, PhD

Hanumant Singh
Professor, Electrical and Computer Engineering and Marine and Environmental Sciences; Massachusetts Institute of Technology, PhD

Sarah S. Sinwell
Assistant Teaching Professor, Media and Screen Studies; Indiana University, PhD

Rifat Sipahi
Associate Professor, Mechanical and Industrial Engineering; University of Connecticut, PhD

Michail V. Sitkovsky
Eleanor W. Black Chair in Immunophysiology and Pharmaceutical Biotechnology and Professor, Pharmaceutical Sciences and Biology; Moscow State University (Russia), PhD

Mark Sivak
Associate Teaching Professor, Art + Design and Engineering; Northeastern University, PhD

Andrew Skirvin
Associate Clinical Professor, Pharmacy and Health Systems Sciences; University of Texas, Austin, PharmD

Nikolai Slavov
Assistant Professor, Bioengineering; Princeton University, PhD

Rory Smead
Assistant Professor, Philosophy and Religion; University of California, Irvine, PhD

David A. Smith
Assistant Professor, Computer and Information Science; Johns Hopkins University, PhD

Gillian Smith
Assistant Professor, Computer and Information Science and Game Design; University of California, Santa Cruz, PhD

Keith Smith
Assistant Professor, Marketing; University of Georgia, PhD

Michael Smith
Assistant Teaching Professor, Architecture; Harvard University, MArch

Ronald Bruce Smith
Associate Professor, Music; University of California, Berkeley, PhD

Wendy A. Smith
College of Arts and Sciences Distinguished Associate Professor, Biology; Duke University, PhD

Eugene Smotkin
Professor, Chemistry and Chemical Biology; University of Texas, Austin, PhD

Bridget Smyser
Associate Teaching Professor, Mechanical and Industrial Engineering; Worcester Polytechnic Institute, PhD

Nancy P. Snyder
Associate Teaching Professor, Psychology; Harvard University, EdD

Claudia Sokol
Assistant Academic Specialist, World Languages Center; University of Buenos Aires (Argentina), MD

Marius M. Solomon
Professor, Supply Chain and Information Management; University of Pennsylvania, PhD

Susan J. Soroka
Assistant Teaching Professor, English; Drew University, PhD

Bert A. Spector
Associate Professor, International Business and Strategy; University of Missouri, PhD

Denise Spencer
Lecturer, Supply Chain and Information Management; Boston College, PhD

Karen M. Spikes
Lecturer, Psychology; Cornell University, PhD

Srinivas Sridhar
College of Arts and Sciences Distinguished Professor, Physics; California Institute of Technology, PhD

Thomas Starr
Professor, Art + Design; Yale University, MFA

Joshua Stefanik
Assistant Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Boston University School of Medicine, PhD

Mary Steffel
Assistant Professor, Marketing; Princeton University, PhD; University of Florida, PhD

Armen Stepanyants
Associate Professor, Physics; University of Rhode Island, PhD

Jennie Stephens
Professor, School of Public Policy and Urban Affairs; California Institute of Technology, PhD

Dagmar Sternad
Professor, Biology and Electrical and Computer Engineering; University of Connecticut, PhD

Sebastian Stockman
Assistant Teaching Professor, English; Emerson College, MFA

Milica Stojanovic
Professor, Electrical and Computer Engineering; Northeastern University, PhD

Janos Stone
Lecturer, Art + Design; Boston University, MFA

Michael Stone
Assistant Teaching Professor, Economics; University of Conneticut, PhD

Jacob I. Stowell
Associate Professor, Criminology and Criminal Justice; State University of New York, Albany, PhD

Tracy Strain
Professor of the Practice, Media and Screen Studies; Harvard University, MEd

Amy Stratman
Assistant Academic Specialist, College of Professional Studies; Simmons College, MAT

Phyllis R. Strauss
Matthews Distinguished University Professor, Biology; Rockefeller University, PhD

Heather Streets-Salter
Associate Professor, History; Duke University, PhD

Ming Su
Associate Professor, Chemical Engineering; Northwestern University, PhD

Fernando Suarez
Jean C. Tempel Professor, Entrepreneurship and Innovation; Massachusetts Institute of Technology, PhD

Alexandru I. Suciu
Professor, Mathematics; Columbia University, PhD

Helen Suh
Professor, Health Sciences; Harvard University, ScD

Annemarie C. Sullivan
Clinical Instructor, Health Sciences; Northeastern University, MS

Denis J. Sullivan
Professor, Political Science and International Affairs; University of Michigan, PhD

Fareena Sultan
Professor, Marketing; Columbia University, PhD

Nian-Xiang Sun
Professor, Electrical and Computer Engineering; Stanford University, PhD

Ravi Sundaram
Professor, Computer and Information Science; Massachusetts Institute of Technology, PhD

Gloria Sutton
Assistant Professor, Art + Design; University of California, Los Angeles, PhD

John D. Swain
Associate Professor, Physics; University of Toronto (Canada), PhD

Richard S. Swasey Jr.
Senior Lecturer, Finance; University of Virginia, MBA

Jacqueline F. Sweeney
Senior Cooperative Education Coordinator, College of Arts, Media and Design; Northeastern University, MS

Nina Sylvanus
Assistant Professor, Sociology and Anthropology; Ecole des Hautes Etudes en Sciences Sociales, Paris (France), PhD

Lynne Sylvia
Clinical Professor, Pharmacy and Health Systems Sciences; Duquesne University, PharmD

Balazs Szelenyi
Associate Teaching Professor, CPS International Programs; University of California, Los Angeles, PhD

Mario Sznaier
Dennis Picard Trustee Professor, Electrical and Computer Engineering; University of Washington, PhD

Gilead Tadmor
Professor, Electrical and Computer Engineering; Weizmann Institute of Science (Israel), PhD

Paul Tagliamonte
Visiting Lecturer, Supply Chain and Information Management; Boston College, MS

David Tamés
Visiting Assistant Teaching Professor, Art + Design; Massachusetts College of Art and Design, MFA

Lloyd Tanlu
Assistant Professor, Accounting; Harvard Business School, PhD

Peter Tarasewich
Assistant Teaching Professor, Supply Chain and Information Management; University of Connecticut, PhD

Mary Suzanne Tarmina
Associate Clinical Professor, Nursing; University of Utah, PhD

Mohammad E. Taslim
Professor, Mechanical and Industrial Engineering; University of Arizona, PhD

Tomasz Taylor
Professor, Physics; University of Warsaw (Poland), PhD

Philip Thai
Assistant Professor, History; Stanford University, PhD

Ganesh Thakur
Associate Professor, Pharmaceutical Sciences; Institute of Chemical Technology (India), PhD

Anna F. Thimsen
Postdoctoral Teaching Associate, Communication Studies; University of North Carolina, PhD

Helen Thomas
Lecturer, Management and Organizational Development; Indiana University, PhD

Ronald S. Thomas
Senior Lecturer, International Business and Strategy; Harvard University, PhD

Mary Thompson-Jones
Professor of the Practice, College of Professional Studies; University of Pennsylvania, EdD

Jamal Thorne
Assistant Teaching Professor, Art + Design; Northeastern University, MFA

George Thrush
Professor, Architecture; Harvard University, MArch

Stefanie Tignor
Visiting Assistant Professor, Marketing; Northeastern University, PhD

Jonathan Tilly
University Distinguished Professor, Biology; Rutgers, the State University of New Jersey, PhD

Devesh Tiwari
Assistant Professor, Electrical and Computer Engineering; North Carolina State University, PhD

Gordana G. Todorov
Professor, Mathematics; Brandeis University, PhD

Alessio Tognetti
Assistant Academic Specialist, World Languages Center; University of Washington, MA

Valerio Toledano Laredo
Professor, Mathematics; University of Cambridge (United Kingdom), PhD

Michael C. Tolley
Associate Professor, Political Science; Johns Hopkins University, PhD

Iraz Topaloglu
Assistant Cooperative Education Coordinator, College of Engineering; California State University, Long Beach, MS

Peter Topalov
Associate Professor, Mathematics; Moscow State University (Russia), PhD

Vladimir P. Torchilin
University Distinguished Professor, Pharmaceutical Sciences; Moscow State University (Russia), PhD, DSc

Ali Touran
Professor, Civil and Environmental Engineering; Stanford University, PhD

Emery A. Trahan
Professor, Finance; State University of New York, Albany, PhD

Andrew Trotman
Assistant Professor, Accounting; Bond University (Australia), PhD

Geoffrey C. Trussell
Professor, Marine and Environmental Sciences; College of William and Mary, PhD

Kumiko Tsuji
Assistant Academic Specialist, World Languages Center; Georgetown University, PhD

Eugene Tunik
Associate Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Rutgers University, PhD

Berna Turam
Professor, International Affairs and Sociology and Anthropology; McGill University (Canada), PhD

Ayten Turkcan Upasani
Assistant Professor, Mechanical and Industrial Engineering; Bilkent University, Ankara (Turkey), PhD

Bonnie TuSmith
Associate Professor, English; Washington State University, PhD

Esther Tutella
Assistant Academic Specialist, College of Professional Studies; Vanderbilt University, MEd

Rafael Ubal Tena
Assistant Teaching Professor, Electrical and Computer Engineering; Universidad Politecnica de Valencia (Spain), PhD

Jonathan Ullman
Assistant Professor, Computer and Information Science; Harvard University, PhD

Annique Un
Associate Professor, International Business and Strategy; Massachusetts Institute of Technology, PhD

Christopher Unger
Assistant Teaching Professor, College of Professional Studies; Harvard University, PhD

Steven R. Untersee
Lecturer, Biology; Tufts University, PhD

Moneesh Upmanyu
Associate Professor, Mechanical and Industrial Engineering; University of Michigan, PhD

Daniel Urman
Assistant Teaching Professor, College of Professional Studies; Harvard University, JD

Steven P. Vallas
Professor, Sociology and Anthropology; Rutgers University, PhD

Jenny A. Van Amburgh
Clinical Professor, Pharmacy and Health Systems Sciences; Albany College of Pharmacy, PharmD

Bobbi Van Gilder
Postdoctoral Teaching Associate, Communication Studies; University of Oklahoma, PhD

Kathi Vander Laan
Assistant Cooperative Education Coordinator, Computer and Information Science; Salem State University, MBA

Jan Vanselow
Associate Cooperative Education Coordinator, College of Engineering; Northeastern University, MS

Ashkan Vaziri
Associate Professor, Mechanical and Industrial Engineering; Northeastern University, PhD

Silvani Vejar
Assistant Academic Specialist, College of Professional Studies; University of Massachusetts, Lowell, MS

Oana Veliche
Lecturer, Mathematics; Purdue University, PhD

Venkata Vemuri
Research Assistant Professor, Pharmaceutical Sciences; Osmania University (India), PhD

Anand Venkateswaran
Associate Professor and Chase Research Fellow, Finance; Georgia State University, PhD

Susan H. Ventura
Associate Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, PhD

Alessandro Vespignani
Distinguished Professor and Sternberg Family Endowed Chair, Physics and Health Sciences and Computer and Information Science; University of Rome La Sapienza (Italy), PhD

Gustavo Vicentini
Assistant Teaching Professor, Economics; Boston University, PhD

Thomas J. Vicino
Associate Professor, Political Science; University of Maryland, PhD

Emanuele Viola
Associate Professor, Computer and Information Science; Harvard University, PhD

Jan Vitek
Professor, Computer and Information Science; University of Geneva (Switzerland), PhD

Olga Vitek
Sy and Laurie Sternberg Interdisciplinary Associate Professor, Chemistry and Chemical Biology and Computer and Information Science; Purdue University, PhD

Steven Vollmer
Associate Professor, Marine and Environmental Sciences; Harvard University, PhD

Robert J. Volpe
Associate Professor, Applied Psychology; Lehigh University, PhD

Erik Voss
Associate Teaching Professor, CPS International Programs; Iowa State University, PhD

Paul Vouros
Professor, Chemistry and Chemical Biology; Massachusetts Institute of Technology, PhD

Sara Wadia-Fascetti
Professor, Civil and Environmental Engineering; Stanford University, PhD

Nancy Waggner
Associate Cooperative Education Coordinator, Pharmaceutical Sciences; Suffolk University, JD

Thomas Wahl
Assistant Professor, Computer and Information Science; University of Texas, Austin, PhD

Thomas Wales
Research Associate Professor, Chemistry and Chemical Biology; Duke University, PhD

Jacob Walker
Assistant Cooperative Education Coordinator, College of Engineering; Northeastern University, MS

Louise E. Walker
Associate Professor, History; Yale University, PhD

Rachel Walsh
Assistant Cooperative Education Coordinator, College of Engineering; Suffolk University, MS

Robin Walters
Postdoctoral Teaching Associate, Psychology; University of Chicago, PhD

Suzanna Danuta Walters
Professor, Sociology and Anthropology and Women's, Gender, and Sexuality Studies; City University of New York, PhD

Richard G. Wamai
Associate Professor, African-American Studies; University of Helsinki (Finland), PhD

Kai-tak Wan
Associate Professor, Mechanical and Industrial Engineering; University of Maryland, College Park, PhD

Lu Wang
Assistant Professor, Computer and Information Science; Cornell University, PhD

Ming Wang
College of Engineering Distinguished Professor, Civil and Environmental Engineering; University of New Mexico, PhD

Qi Wang
Assistant Professor, Civil and Environmental Engineering; Virginia Polytechnic Institute and State University, PhD

Meni Wanunu
Assistant Professor, Physics; Weizmann Institute of Science (Israel), PhD

Robert J. Ward
Lecturer, Music; University of California, San Diego, MA

Gregory H. Wassall
Associate Professor, Economics; Rutgers University, PhD

Barbara L. Waszczak
Professor, Pharmaceutical Sciences; University of Michigan, PhD

Maureen Watkins
Assistant Clinical Professor, Physical Therapy, Movement, and Rehabilitation Sciences; Northeastern University, DPT

Natalya Watson
Assistant Teaching Professor, CPS International Programs; University of Colorado, PhD

Dov Waxman
Professor, Political Science and International Affairs; Johns Hopkins University, PhD

Thomas J. Webster
Professor, Chemical Engineering; Rensselaer Polytechnic Institute, PhD

Liza Weinstein
Assistant Professor, Sociology and Anthropology; University of Chicago, PhD

Michael Weintraub
Associate Clinical Professor, Computer and Information Science; Ohio State University, PhD

Jonathan Weitsman
Robert G. Stone Professor, Mathematics; Harvard University, PhD

Brandon C. Welsh
Professor, Criminology and Criminal Justice; University of Cambridge (United Kingdom), PhD

Edward G. Wertheim
Associate Professor, Management and Organizational Development; Yeshiva University (Israel), PhD

Richard West
Assistant Professor, Chemical Engineering; University of Cambridge (United Kingdom), PhD

Alan West-Duran
Associate Professor, Languages, Literatures, and Cultures; New York University, PhD

Richard Whalen
Teaching Professor, Engineering; Northeastern University, PhD

Ronald M. Whitfield
Assistant Academic Specialist, Finance; University of Pennsylvania, PhD

Paul Whitford
Assistant Professor, Physics; University of California, San Diego, PhD

John Whitney
Assistant Professor, Mechanical and Industrial Engineering; Harvard University, PhD

Daniel Wichs
Assistant Professor, Computer and Information Science; New York University, PhD

Allan Widom
Professor, Physics; Cornell University, PhD

Peter H. Wiederspahn
Associate Professor, Architecture; Harvard University, MArch

John Wihbey
Assistant Professor, Journalism; Columbia University, MS

Ronald J. Willey
Professor, Chemical Engineering; University of Massachusetts, Amherst, PhD

Mark C. Williams
Professor, Physics; University of Minnesota, PhD

Stephen Williams
Assistant Cooperative Education Coordinator, College of Social Sciences and Humanities; Suffolk University, JD

Christo Wilson
Assistant Professor, Computer and Information Science; University of California, Santa Barbara, PhD

Sheila Winborne
Visiting Lecturer, Philosophy and Religion; Harvard University, PhD

Frederick Wiseman
Professor, Supply Chain and Information Management; Cornell University, PhD

John Wolfe
Associate Teaching Professor, College of Professional Studies; Columbia University, EdD

Paul Wolff
Assistant Cooperative Education Coordinator, College of Engineering; University of Pennsylvania, PhD

Darien Wood
Professor, Physics; University of California, Berkeley, PhD

Dori Woods
Assistant Professor, Biology; University of Notre Dame, PhD

Adam Woolley
Assistant Clinical Professor, Pharmacy and Health Systems Sciences; Massachusetts College of Pharmacy, PharmD

Lisa C. Worsh
Senior Cooperative Education Coordinator, College of Social Sciences and Humanities; Bridgewater State College, MEd

Nicole Wright
Assistant Professor, Accounting; Virginia Polytechnic Institute and State University, PhD

Shu-Shih Wu
Lecturer, Mathematics; Northeastern University, PhD

Sara A. Wylie
Assistant Professor, Sociology and Anthropology and Health Sciences; Massachusetts Institute of Technology, PhD

Yu (Amy) Xia
Associate Professor, Supply Chain and Information Management; Washington State University, PhD

Shiawee X. Yang
Associate Professor, Finance; Pennsylvania State University, PhD

Mishac K. Yegian
College of Engineering Distinguished Professor, Civil and Environmental Engineering; Massachusetts Institute of Technology, PhD

Edmund Yeh
Associate Professor, Electrical and Computer Engineering; Massachusetts Institute of Technology, PhD

Benjamin Yelle
Assistant Teaching Professor, Philosophy and Religion; University of Miami, PhD

Sheng-Che Yen
Assistant Professor, Physical Therapy, Movement, and Rehabilitation Sciences; New York University, PhD

Mark L. Yorra
Senior Cooperative Education Coordinator, Bouvé College of Health Sciences; Northeastern University, EdD

Gary Young
Professor, International Business and Strategy and Health Sciences; State University of New York, Buffalo, PhD

Lydia Young
Associate Teaching Professor, College of Professional Studies; Boston College, PhD

Sara C. Young-Hong
Clinical Instructor, Communication Sciences and Disorders; University of Pittsburgh, MA

Shuishan Yu
Associate Professor, Architecture; University of Washington, PhD

Jennifer Yule
Assistant Academic Specialist, Marketing; Glasgow Caledonian University (Scotland), PhD

Nizar Zaarour
Assistant Teaching Professor, Supply Chain and Information Management; Northeastern University, PhD

Michelle Zaff
Assistant Cooperative Education Coordinator, College of Social Sciences and Humanities; Suffolk University, JD

Christos Zahopoulos
Associate Professor, Education; Northeastern University, PhD

Carl Zangerl
Assistant Teaching Professor, College of Professional Studies; University of Illinois, PhD

Alan J. Zaremba
Associate Professor, Communication Studies; State University of New York, Buffalo, PhD

Michele Jade Zee
Assistant Teaching Professor, Behavioral Neuroscience; University of Oregon, PhD

Ibrahim Zeid
Professor, Mechanical and Industrial Engineering; University of Akron, PhD

Edward David Zepeda
Assistant Professor, Supply Chain and Information Management; University of Minnesota, PhD

David P. Zgarrick
Professor, Pharmacy and Health Systems Sciences; Ohio State University, PhD

Ke Zhang
Assistant Professor, Chemistry and Chemical Biology; Washington University, St. Louis, PhD

Yue May Zhang
Associate Professor, Accounting; University of Pittsburgh, PhD

Ting Zhou
Associate Professor, Mathematics; University of Washington, PhD

Zhaohui Zhou
Professor, Chemistry and Chemical Biology; Scripps Research Institute, PhD

Hongli Zhu
Assistant Professor, Mechanical and Industrial Engineering; South China University of Technology (China), PhD

Sally Tebbourne Ziane
Associate Academic Specialist, World Languages Center; University of Paris XIII (France), PhD

Nathanial Ziegler
Assistant Cooperative Education Coordinator, College of Engineering; Indiana University of Pennsylvania, MEd

Katherine S. Ziemer
Professor, Chemical Engineering; West Virginia University, PhD

Emily Zimmerman
Assistant Professor, Communication Sciences and Disorders; University of Kansas, PhD

Gregory M. Zimmerman
Assistant Professor, Criminology and Criminal Justice; State University of New York, Albany, PhD

Kathrin Zippel
Associate Professor, Sociology and Anthropology; University of Wisconsin, Madison, PhD

Ronald Zullo
Lecturer, Accounting; Bentley University, MS

Günther K. H. Zupanc
Professor, Biology; University of California, San Diego, PhD; University of Tübingen (Germany), Dr. rer. nat. habil.

Nikolai Zvonok
Research Assistant Professor, Pharmaceutical Sciences; Russian Academy of Sciences (Russia), PhD

Appendix

Governing Boards and Officers of Northeastern

Officers of the Corporation and Board of Trustees 2017–2018

Richard A. D'Amore, *Chair*
Edward G. Galante, *Vice Chair*
Katherine S. McHugh, *Vice Chair*
Alan S. McKim, *Vice Chair*

OFFICERS EMERITAE/I

Neal F. Finnegan, *Chair Emeritus*
Sy Sternberg, *Chair Emeritus*
George D. Behrakis, *Vice Chair Emeritus*
George W. Chamillard, *Vice Chair Emeritus*
Richard P. Chapman Jr., *Vice Chair Emeritus*
H. Patricia Hanna, *Vice Chair Emerita*
Frederic T. Hersey, *Vice Chair Emeritus*
Robert C. Marini, *Vice Chair Emeritus*
Richard C. Ockerbloom, *Vice Chair Emeritus*
Carole J. Shapazian, *Vice Chair Emerita*
Jean C. Tempel, *Vice Chair Emerita*
Alan D. Tobin, *Vice Chair Emeritus*

Members of the Board of Trustees

Barbara C. Alleyne
Jeffrey S. Bornstein
Nonnie S. Burnes
Peter B. Cameron
Jeffrey J. Clarke
William J. Conley
William J. Cotter
William "Mo" Cowan
Richard A. D'Amore
Susan Deitch
Deborah Dunsire
Spencer T. Fung
Edward G. Galante
Sir Lucian Grainge
David L. House
William S. Howard
Frances N. Janis
Chaitanya Kanojia
Venetia G. Kontogouris
William A. Lowell
Todd M. Manganaro
Katherine S. McHugh
Alan S. McKim
Henry J. Nasella
Anita Nassar
Kathryn M. Nicholson
James J. Pallotta
John V. Pulichino
Marcy L. Reed
Winslow Sargeant
Ronald L. Sargent
Sy Sternberg
Melina Travlos
Joseph M. Tucci
Christopher A. Viehbacher
Christophe P. Weber
Arthur W. Zafiropoulo
Michael J. Zamkow

EX-OFFICIO

Joseph E. Aoun

TRUSTEES EMERITAE/I

George D. Behrakis
Margot Botsford
Frederick Brodsky
Frederick L. Brown
Louis W. Cabot
George W. Chamillard
Richard P. Chapman Jr.
John J. Cullinane
Harry T. Daniels
Edmond J. English
James V. Fetchero
Neal F. Finnegan
W. Kevin Fitzgerald
H. Patricia Hanna
Frederic T. Hersey
Arnold S. Hiatt
J. Philip Johnston
Richard G. Lesser
Diane H. Lupean
Anthony R. Manganaro
Robert C. Marini
Roger M. Marino
Lloyd J. Mullin
Richard C. Ockerbloom
Arthur A. Pappas
Thomas L. Phillips
Dennis J. Picard
Ronald L. Rossetti
Carole J. Shapazian
Robert J. Shillman
Janet M. Smith
Stephen J. Sweeney
Jean C. Tempel
W. Nicholas Thorndike
Alan D. Tobin
James L. Waters
Catherine A. White
Ellen M. Zane

HONORARY TRUSTEES

Scott M. Black
Chad Gifford
Kuntoro Mangkusubroto
Lucille R. Zanghi

Richard A. D'Amore, *Chair*
Edward G. Galante, *Vice Chair*

Katherine S. McHugh, *Vice Chair*
Alan S. McKim, *Vice Chair*

OFFICERS EMERITAE/I

Neal F. Finnegan, *Chair Emeritus*
Sy Sternberg, *Chair Emeritus*
George D. Behrakis, *Vice Chair Emeritus*
George W. Chamillard, *Vice Chair Emeritus*
Richard P. Chapman Jr., *Vice Chair Emeritus*
H. Patricia Hanna, *Vice Chair Emerita*
Frederic T. Hersey, *Vice Chair Emeritus*
Robert C. Marini, *Vice Chair Emeritus*
Richard C. Ockerbloom, *Vice Chair Emeritus*
Carole J. Shapazian, *Vice Chair Emerita*
Jean C. Tempel, *Vice Chair Emerita*
Alan D. Tobin, *Vice Chair Emeritus*

Members of the Board of Trustees

Barbara C. Alleyne
Jeffrey S. Bornstein
Nonnie S. Burnes
Peter B. Cameron
Jeffrey J. Clarke
William J. Conley
William J. Cotter
William "Mo" Cowan
Richard A. D'Amore
Susan Deitch
Deborah Dunsire
Spencer T. Fung
Edward G. Galante
Sir Lucian Grainge
David L. House
William S. Howard
Frances N. Janis
Chaitanya Kanojia
Venetia G. Kontogouris
William A. Lowell
Todd M. Manganaro
Katherine S. McHugh
Alan S. McKim
Henry J. Nasella
Anita Nassar
Kathryn M. Nicholson
James J. Pallotta
John V. Pulichino
Marcy L. Reed
Winslow Sargeant
Ronald L. Sargent
Sy Sternberg
Melina Travlos
Joseph M. Tucci
Christopher A. Viehbacher
Christophe P. Weber
Arthur W. Zafiropoulo
Michael J. Zamkow

EX-OFFICIO

Joseph E. Aoun

TRUSTEES EMERITAE/I

George D. Behrakis
Margot Botsford
Frederick Brodsky
Frederick L. Brown
Louis W. Cabot
George W. Chamillard
Richard P. Chapman Jr.
John J. Cullinane
Harry T. Daniels
Edmond J. English
James V. Fetchero
Neal F. Finnegan
W. Kevin Fitzgerald
H. Patricia Hanna
Frederic T. Hersey
Arnold S. Hiatt
J. Philip Johnston
Richard G. Lesser
Diane H. Lupean
Anthony R. Manganaro
Robert C. Marini
Roger M. Marino
Lloyd J. Mullin
Richard C. Ockerbloom
Arthur A. Pappas
Thomas L. Phillips
Dennis J. Picard
Ronald L. Rossetti
Carole J. Shapazian
Robert J. Shillman
Janet M. Smith
Stephen J. Sweeney
Jean C. Tempel
W. Nicholas Thorndike
Alan D. Tobin
James L. Waters
Catherine A. White
Ellen M. Zane

HONORARY TRUSTEES

Scott M. Black
Chad Gifford
Kuntoro Mangkusubroto
Lucille R. Zanghi

University Leadership

Officers of the University

Joseph E. Aoun, BA, MA, PhD, *President*
Michael A. Armini, BA, MA, *Senior Vice President for External Affairs*
James C. Bean, BS, MS, PhD, *Provost and Senior Vice President for Academic Affairs*
Diane Nishigaya MacGillivray, BA, MA, *Senior Vice President for University Advancement*
Philomena V. Mantella, BS, MSW, PhD, *Senior Vice President and CEO of the Northeastern University Global Network*
Ralph C. Martin II, BA, JD, *Senior Vice President and General Counsel*
Thomas Nedell, BA, MBA, *Senior Vice President for Finance and Treasurer*

Academic Deans

Nadine Aubry, BS, MS, PhD, *Dean of the College of Engineering*
Carla E. Brodley, BA, MS, PhD, *Dean of the College of Computer and Information Science*
Hugh G. Courtney, BA, PhD, *Dean of the D'Amore-McKim School of Business*
Kenneth W. Henderson, BSc, PhD, *Dean of the College of Science*

Elizabeth Hudson, BA, MA, PhD, *Dean of the College of Arts, Media and Design*
Mary Loeffelholz, BA, MA, PhD, *Interim Dean of the College of Professional Studies*
Jeremy Paul, AB, JD, *Dean of the School of Law*
Uta Poiger, BA, MA, AM, PhD, *Dean of the College of Social Sciences and Humanities*
Jack Reynolds, BS, PharmD, *Interim Dean of Bouvé College of Health Sciences*

Vice Provosts

Susan Ambrose, BA, MA, PhD, *Senior Vice Provost for Undergraduate Education and Experiential Learning*
John Armendariz, EdD, *Vice Provost for Institutional Diversity and Inclusion*
Debra Franko, BA, PhD, *Interim Vice Provost for Academic Affairs*
Arthur F. Kramer, BS, PhD, *Senior Vice Provost for Research and Graduate Education*
Anthony Rini, BA, MPA, EdD, *Vice Provost for Budget, Planning, and Administration*

Vice Presidents

Greg Condell, BA, MBA, *Vice President for Finance*
Rick Davis, BS, MA, *Vice President for Alumni Relations*
Joseph J. Donnelly Jr., BA, *Vice President for Advancement and Campaign Director*
Nicholas F. Ducoff, BBA, JD, *Vice President for New Ventures*
Madeleine A. Estabrook, AB, JD, *Vice President for Student Affairs and Dean of Students*
Seamus Harreys, BA, EdM, MBA, *Vice President for Business Affairs, Graduate Campuses*
Rehan Khan, BS, MBA, *Vice President and Chief Information Officer*
Luanne M. Kirwin, BA, MA, *Vice President of Development*
Sundar Kumarasamy, BA, MS, *Vice President for Enrollment Management*
Vincent J. Lembo, BA, JD, *Vice President and Senior Counsel*
Timothy E. Leshan, BA, MPA, *Vice President for Government Relations*
Chris Mallet, BS, MPA, *Vice President of Online Programs*
Nancy May, AS, BS, *Vice President for Facilities*
Katherine N. Pendergast, BA, MEd, *Vice President for Human Resources Management*
Lisa Sinclair, BA, JD, *Vice President of Legal Affairs*
Kathy Spiegelman, BA, MS, *Vice President, Chief of Campus Planning and Development*
Brian Sullivan, BS, MBA, *Vice President and Chief Marketing Officer*
John Tobin, BA, *Vice President for City and Community Affairs*

Other Administrative Leaders

Linda D. Allen, BA, MEd, *Assistant Vice President and University Registrar*
Michael A. Davis, BA, MA, *Director of Public Safety and Chief of Police*
James R. Hackney, AB, JD, *Chief of Staff, Senior Strategy Advisor, and Professor of Law*
Renata Nyul, BA, MS, *Assistant Vice President for Communications*
Peter P. Roby, BA, MS, *Director of Athletics and Recreation*
Kerry Salerno, BS, MBA, *Assistant Vice President for Enrollment and Dean of Admissions and Marketing*
William Wakeling, BA, MA, MA, *Dean, University Libraries*

Statements of Accreditation and State Authorization

Accreditation

Northeastern University has maintained its status as a member in good standing of the New England Association of Schools and Colleges (NEASC) Commission on Institutions of Higher Education (CIHE) since it was awarded its initial accreditation in 1940. The university was last reviewed by NEASC in 2008 and will be reviewed again in fall 2018.

Northeastern University possesses degree-granting authority in Massachusetts, under the auspices of the Massachusetts Board of Higher Education.

Program	Accrediting Agency
Northeastern University	New England Association of Schools and Colleges (NEASC)

BOUVÉ COLLEGE OF HEALTH SCIENCES

Program	Accrediting Agency
BS in Athletic Training	Commission on Accreditation of Athletic Training Education (CAATE)
MS in Speech-Language Pathology and Audiology	Council on Academic Accreditation in Audiology and Speech-Language Pathology (CAA) of the American Speech-Language-Hearing Association (ASHA), Massachusetts Board of Education[1]
BS in Nursing	Commission on Collegiate Nursing Education (CCNE) and Massachusetts Board of Registration in Nursing[2]
MS in Physician Assistant Studies	Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA)
MS in Nursing	Commission on Collegiate Nursing Education (CCNE) and Massachusetts Board of Registration in Nursing[2]
MS in Nursing in Anesthesia	Council on Accreditation of Nurse Anesthesia Educational Programs (COA); Commission on Collegiate Nursing Education (CCNE) and Massachusetts Board of Registration in Nursing[2]
Registered Nurse/BSN[3]	Commission on Collegiate Nursing Education (CCNE) and Massachusetts Board of Registration in Nursing[2]
Post BS Doctor of Nursing Practice US Army Program in Anesthesia Nursing (USAGPAN)	Council on Accreditation of Nurse Anesthesia Educational Programs (COA)
DPT in Physical Therapy	Commission on Accreditation of Physical Therapy Education (CAPTE)
MS/MBA (two-year program)	Commission on Collegiate Nursing Education (CCNE) and Massachusetts Board of Registration in Nursing[2]; Commission on Collegiate Nursing Education (CCNE) and the Association to Advance Collegiate Schools of Business (AACSB International)

MS and CAGS in Applied Educational Psychology— School Psychology	Massachusetts Department of Education (DOE) and National Association of School Psychologists (NASP)
MS in Applied Educational Psychology — School Counseling	Massachusetts Department of Education (DOE)
AuD in Audiology	Council on Academic Accreditation in Audiology and Speech-Language Pathology (CAA) of the American Speech-Language-Hearing Association (ASHA), Massachusetts Board of Education[1]
MPH Master of Public Health in Urban Health	Council on Education for Public Health
PharmD	Accreditation Council for Pharmacy Education (ACPE)
PhD in Counseling and School Psychology	American Psychology Association (APA)

[1] The Massachusetts Board of Education approves (not accredits) programs.

[2] The Massachusetts Board of Registration in Nursing approves (not accredits) programs.

[3] Accredited under the aegis of the "sponsoring" full-time college.

College of Arts, Media and Design

Program	Accrediting Agency
Master of Architecture (Urban Architecture)	National Architectural Accreditation Board (NAAB)

D'Amore-McKim School of Business

Program	Accrediting Agency
BS in Business Administration	AACSB International—The Association to Advance Collegiate Schools of Business
BS and MS in International Business	AACSB International—The Association to Advance Collegiate Schools of Business
MBA	AACSB International—The Association to Advance Collegiate Schools of Business
MS in Finance	AACSB International—The Association to Advance Collegiate Schools of Business
MS in Taxation	AACSB International—The Association to Advance Collegiate Schools of Business
MS in Accounting	AACSB International—The Association to Advance Collegiate Schools of Business
MS in Accounting/MBA	AACSB International—The Association to Advance Collegiate Schools of Business
MS in Finance/MBA	AACSB International—The Association to Advance Collegiate Schools of Business
MS in Technological Entrepreneurship	AACSB International—The Association to Advance Collegiate Schools of Business

College of Computer and Information Science

Program	Accrediting Agency
BS in Computer Science	Computing Accreditation Commission of ABET (Accreditation Board for Engineering and Technology)

College of Engineering

Program	Accrediting Agency
BS in Computer Engineering	Engineering Accreditation Commission of ABET
BS in Chemical Engineering	Engineering Accreditation Commission of ABET
BS in Civil Engineering	Engineering Accreditation Commission of ABET
BS in Electrical Engineering	Engineering Accreditation Commission of ABET
BS in Industrial Engineering	Engineering Accreditation Commission of ABET
BS in Mechanical Engineering	Engineering Accreditation Commission of ABET

College of Professional Studies

Program	Accrediting Agency
AS and Certificate in Paramedic Technology	Massachusetts Department of Public Health, Office of Emergency Medical Services
BS in Finance and Accounting Management[1]	AACSB International—The Association to Advance Collegiate Schools of Business
BS in Management[1]	AACSB International—The Association to Advance Collegiate Schools of Business
BS and AS in Computer Engineering Technology	Accredited by the Technology Accreditation Commission of ABET, 111 Market Place Suite 1050 Baltimore, MD 21202-4012 Telephone: 410.347.7700
BS and AS in Electrical Engineering Technology	Accredited by the Technology Accreditation Commission of ABET, 111 Market Place Suite 1050 Baltimore, MD 21202-4012 Telephone: 410.347.7700
BS and AS in Mechanical Engineering Technology	Accredited by the Technology Accreditation Commission of ABET, 111 Market Place Suite 1050 Baltimore, MD 21202-4012 Telephone: 410.347.7700
Education Programs in:	
Teacher of Biology, 8–12	Massachusetts Department of Elementary and Secondary Education
Teacher of Chemistry, 8–12	Massachusetts Department of Elementary and Secondary Education

Teacher of Earth Science, 5–8, 8–12	Massachusetts Department of Elementary and Secondary Education
Teacher of Mathematics, 5–8, 8–12	Massachusetts Department of Elementary and Secondary Education
Teacher of Physics, 8–12	Massachusetts Department of Elementary and Secondary Education
Elementary Education, 1–6	Massachusetts Department of Elementary and Secondary Education
Teacher of English, 8–12	Massachusetts Department of Elementary and Secondary Education
Teacher of Foreign Language: Spanish, 5–12	Massachusetts Department of Elementary and Secondary Education
Teacher of History, 8–12	Massachusetts Department of Elementary and Secondary Education
Teacher of Political Science/Political Philosophy, 8–12	Massachusetts Department of Elementary and Secondary Education
Teacher of Students with Moderate Disabilities Pre-K–8, 5–12	Massachusetts Department of Elementary and Secondary Education
MS in Leadership with Project Management	Project Management Institute's Global-Accreditation-Center
MS in Technology Commercialization	AACSB International—The Association to Advance Collegiate Schools

[1] Accredited under the aegis of the "sponsoring" full-time college.

College of Social Science and Humanities

Program	Accrediting Agency
BS in Criminal Justice	Massachusetts Board of Education [1]
MS in Criminal Justice	Massachusetts Board of Education[1]
PhD in Criminal Justice	Massachusetts Board of Education[1]
Master of Public Administration	National Association of Schools of Public Affairs and Administration

[1] The Massachusetts Board of Education approves (not accredits) programs.

School of Law

Program	Accrediting Agency
JD	American Bar Association Association of American Law Schools[4]

[4] The Association of American Law Schools is an elected membership organization, not an accrediting body.

State Approvals, Authorizations, and Exemptions

Some states require that universities authorized to operate in their state make public disclosures. See the corresponding addendum on the Online and Graduate Professional Degree Programs website (http://www.northeastern.edu/online/about-northeastern-online/state-agreements.php) for up-to-date, state-prescribed regulatory information applicable to all degree levels.

Institutional Calendars and Online Resources

The online resources listed below supplement this catalog.

Institutional Calendars

University events:
www.curry.neu.edu (http://www.curry.neu.edu)

Academic calendars:
www.northeastern.edu/registrar/calendars.html (http://www.northeastern.edu/registrar/calendars.html)

Other Online Resources

Course descriptions:
www.northeastern.edu/registrar/banner-catalog.html (http://www.northeastern.edu/registrar/banner-catalog.html)

Class schedules:
www.northeastern.edu/registrar/banner-schedule.html (http://www.northeastern.edu/registrar/banner-schedule.html)

Campus maps:
www.northeastern.edu/campusmap (http://www.northeastern.edu/campusmap)

General Information

The *Northeastern University Graduate Catalog* contains the university's primary statements about these academic programs and degree requirements, as authorized by the president or the Board of Trustees. For information about other academic policies and procedures; student responsibilities; student academic and cocurricular life; faculty rights and responsibilities; or general personnel policies, benefits, and services, please refer to the *Cooperative Education Student Handbook, Faculty Handbook,* and related procedural guides, as appropriate.

Accreditation. Northeastern University is accredited by the New England Association of Schools and Colleges, Inc.

Delivery of Services. Northeastern University assumes no liability for delay or failure to provide educational or other services or facilities due to causes beyond its reasonable control. Causes include, without limitation, power failure, fire, strikes by university employees or others, damage by natural elements, and acts of public authorities. The university will, however, exert reasonable efforts, when it judges them to be appropriate, to provide comparable services, facilities, or performance; but its inability or failure to do so shall not subject the university to liability.

The *Northeastern University Graduate Catalog* contains current information about the university calendar, admissions, degree requirements, fees, and regulations; however, such information is not intended and should not be regarded to be contractual.

Northeastern University reserves the sole right to promulgate and change rules and regulations and to make changes of any nature in its

program; calendar; admissions policies, procedures, and standards; degree requirements; fees; and academic schedule whenever necessary or desirable, including, without limitation, changes in course content and class schedule, the cancellation of scheduled classes and other academic activities, and the substitution of alternatives for scheduled classes and other academic activities. In any such case, the university will give whatever notice is reasonably practical.

Northeastern University will endeavor to make available to its students a fine education and a stimulating and congenial environment. However, the quality and rate of progress of an individual's academic career and professional advancement upon completion of a degree or program are largely dependent on his or her own abilities, commitment, and effort. In many professions and occupations, there are also requirements imposed by federal and state statutes and regulatory agencies for certification or entry into a particular field. These requirements may change while a student is enrolled in a program and may vary from state to state or country to country. Although the university stands ready to help its students find out about requirements and changes in them, it is the student's responsibility to initiate the inquiry.

Tuition Default Policy. In cases where the student defaults on his or her tuition, the student shall be liable for the outstanding tuition and all reasonable associated collection costs incurred by the university, including attorneys' fees.

Emergency Closing of the University. Northeastern University posts emergency announcements, including news of weather-related closings, on its homepage (http://www.northeastern.edu) and notifies members of the community individually through the NU ALERT system. In addition, the university has made arrangements to notify students, faculty, and staff by radio and television when it becomes necessary to cancel classes because of extremely inclement weather. AM stations WBZ (1030), WILD (1090), and WRKO (680), and FM station WBUR (90.9) are the radio stations authorized to announce the university's decision to close. Television stations WBZ-TV4, WCVB-TV5, and WHDH-TV7 will also report cancellations. Since instructional television courses originate from live or broadcast facilities at the university, neither the classes nor the courier service operates when the university is closed. Please listen to the radio or television to determine whether the university will be closed.

If a storm occurs at night, the announcement of university closing is given to the radio stations at approximately 6 a.m. Classes are generally canceled for that entire day and evening at all campus locations unless stated otherwise. When a storm begins late in the day, cancellations of evening classes may be announced. This announcement is usually made between 2 p.m. and 3 p.m.

Equal Opportunity Policy. Northeastern University does not discriminate on the basis of race, color, religion, sex, sexual orientation, age, national origin, disability, or veteran status in admission to, access to, treatment in, or employment in its programs and activities. In addition, Northeastern University will not condone any form of sexual harassment. Handbooks containing the university's nondiscrimination policies and its grievance procedures are available in the Office of Institutional Diversity and Inclusion, 125 Richards Hall. Inquiries regarding the university's nondiscrimination policies may be directed to:

Office of Institutional Diversity and Inclusion
125 Richards Hall
Northeastern University
Boston, Massachusetts 02115
617.373.2133

Inquiries concerning the application of nondiscrimination policies may also be referred to the Regional Director, Office for Civil Rights, U.S. Department of Education, 8th Floor, 5 Post Office Square, Boston, MA 02109-3921.

Disability Resource Center. The Disability Resource Center provides a variety of disability-related services and accommodations to Northeastern University's students and employees with disabilities.

Northeastern University's compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 are coordinated by the senior director of the Disability Resource Center. Persons requiring information regarding the Disability Resource Center should contact the center at 617.373.2675 or, if using TTY, via Relay 711.

Family Educational Rights and Privacy Act. In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits its students to inspect their records wherever appropriate and to challenge specific parts of them when they feel it is necessary to do so. Specific details of the law as it applies to Northeastern are printed in the *Undergraduate Student Handbook* and *Graduate Student Handbook* and are distributed annually at registration for the university's colleges and graduate schools.

Cleary Act. Northeastern is committed to assisting all members of the university community in providing for their own safety and security. Information regarding campus security and personal safety, including topics such as crime prevention, university police law enforcement authority, crime reporting policies, crime statistics for the most recent three-year period, and disciplinary procedures, is available upon request from the Northeastern University Director of Public Safety, 360 Huntington Avenue, Boston, MA 02115, or by calling 617.373.2696.

Mission Statement:
To educate students for a life of fulfillment and accomplishment.
To create and translate knowledge to meet global and societal needs.

Index