



Northeastern University

**Graduate Catalog
2016–2017**

Table of Contents

General Admission and Transfer Credit	8	Academic Calendars	25
Regulations Applying to All Degree Programs	8	Student Records and Transcripts	26
Regulations Applying only to Doctor of Philosophy (PhD) Programs	9	Final Examinations and Related Policies on Other Exams	29
General Regulations and Requirements for Nondegree Certificate Programs	9	Graduation Requirements	29
General Regulations and Requirements for the Master's Degree	9	Family Educational Rights and Privacy Act (FERPA)	29
General Regulations and Requirements for the Certificate of Advanced Graduate Study	10	Student Right-to-Know Act	30
General Regulations and Requirements for the Research Doctorate (PhD and EdD)	10	Code of Student Conduct	30
General Regulations and Requirements for Interdisciplinary Graduate Degrees	11	Appeals Policies and Procedures	30
Information for Entering Students	13	General Regulations	32
Living in Boston	13	Students' Bill of Academic Rights and Responsibilities	38
Information for International Students	13	College of Arts, Media and Design	40
Academic Resources	14	Academic Policies and Procedures	40
Libraries	14	General Information	40
Office of the Registrar	15	Master's Degree Policies	40
Information Technology Services	15	Graduate Student Classification	41
Campus Resources	16	School of Architecture	41
Career Services	16	Master of Architecture—One-Year Program	42
Campus Recreation	16	Master of Architecture—Two-Year Program	42
Center for Advancing Teaching and Learning Through Research	16	Master of Architecture—Three-Year Program	43
Disability Resource Center	17	Master of Architecture—Three-Year Program—Advanced Degree Entrance	44
Graduate Student Government	17	Master of Design for Sustainable Urban Environments—One-Year Program	45
Husky Card Services	17	Master of Design for Sustainable Urban Environments—Two-Year Program	46
John A. and Marcia E. Curry Student Center	18	Master of Architecture and Sustainable Urban Environments—Combined Program	47
Northeastern University Bookstore	18	Art + Design	47
Parking	18	Information Design and Visualization, MFA	47
Public Safety	18	Interdisciplinary Arts, MFA	48
University Health and Counseling Services	19	Studio Arts—School of the Museum of Fine Arts, MFA	49
We Care	19	Arts Administration and Cultural Entrepreneurship, Graduate Certificate	50
College Expenses	20	Game Design	50
Tuition and Fees	20	Game Science and Design, MS	51
Student Refunds	20	Game Analytics, Graduate Certificate	52
Financial Aid Assistance	21	School of Journalism	53
Bill Payment	23	Journalism, MA	53
University-Wide Academic Policies and Procedures	24	Music	53
Graduate Schools Academic Policies	24	Music Industry Leadership, MS	54
		NEC/NU Joint Certificate Program—General Certificate of Merit in Music Performance	55

NEC/NU Joint Certificate Program—Professional Studies Certificate in Music Performance	56	Supply Chain Management—Online Program, Graduate Certificate	80
Music Industry Leadership, JD/MS	58	Technological Entrepreneurship, Graduate Certificate	80
D'Amore-McKim School of Business	59	College of Computer and Information Science	81
Master of Science	59	Academic Policies and Procedures	81
Business Analytics, MS	59	Absenteeism	81
Innovation, MS	60	ACADEMIC INTEGRITY	81
International Management, MS	60	Transfer of Credit	81
Technological Entrepreneurship, MS	61	Computer Science	82
Accounting, MSA	61	Computer Science, PhD	82
Finance, MSF	62	Computer Science, PhD—Advanced Entry	85
Finance—Evening/Part-Time Program, MSF	62	Data Science, MS	85
Finance—Online Program, MSF	62	Computer Science, MSCS	87
International Business, MSIB	63	Computer Science, MSCS—ALIGN Program	88
Taxation, MST	63	Computer Science, Graduate Certificate	89
Taxation—Online Program, MST	63	Health Informatics	90
Master of Business Administration	64	Personal Health Informatics, PhD	90
Business Administration, MBA—Full-Time Program	64	Health Data Analytics, MS	92
Business Administration, MBA—Evening/Part-Time Program	66	Health Informatics, MS	93
Business Administration, MBA—Online Program	69	Health Informatics, MS—ALIGN Program	94
Dual Degrees	70	Information Assurance	94
MS/MBA—Nursing and Business Administration	71	Information Assurance, PhD	95
MSA/MBA—Professional Accounting Program	71	Information Assurance, PhD—Advanced Entry	96
MSF/MBA—Full-Time Program	71	Information Assurance and Cyber Security, MSIA	97
MSF/MBA—Evening/Part-Time Program	72	Information Assurance and Cyber Security, MSIA—ALIGN Program	98
MSF/MBA—Online Program	73	Interdisciplinary	99
JD/MBA	74	Game Science and Design, MS	51
Graduate Certificate Programs	74	Data Analytics, Graduate Certificate	100
Accounting and Financial Decision Making, Graduate Certificate	74	College of Engineering	102
Business Administration, Graduate Certificate	75	Academic Policies and Procedures	102
Business Administration—Online Program, Graduate Certificate	76	Learning Outcomes	102
Corporate Finance, Graduate Certificate	77	Admission Requirements	102
Corporate Renewal, Graduate Certificate	77	Cooperative Education Policies	102
Healthcare Administration and Policy, Graduate Certificate	77	Online and Video Streaming Examination Policy	104
Innovation Management, Graduate Certificate	78	Course Registration and Withdrawal	104
International Business, Graduate Certificate	78	Academic Standards and Degree Requirements	105
Investments, Graduate Certificate	78	Administrative Procedures	106
Leadership and Human Capital, Graduate Certificate	79	Petitions	106
Marketing, Graduate Certificate	79	Bioengineering	107
Mutual Fund Management, Graduate Certificate	79	Bioengineering, PhD	107
Supply Chain Management, Graduate Certificate	80	Bioengineering, PhD—Advanced Entry	114
		Bioengineering, MSBioE	116

Chemical Engineering	119	Energy Systems, MS	159
Chemical Engineering, PhD	119	Energy Systems Graduate Certificates	160
Chemical Engineering, PhD—Advanced Entry	120	Renewable Energy, Graduate Certificate	160
Chemical Engineering, MSCHE	122	Energy Systems, Graduate Certificate	161
Process Safety Engineering, Graduate Certificate	123	Energy Systems Management, Graduate Certificate	161
Civil and Environmental Engineering	124	Sustainable Energy Systems, Graduate Certificate	161
Civil Engineering, PhD	124	Graduate Certificate Programs	162
Civil Engineering, PhD—Advanced Entry	125	Gordon Institute of Engineering Leadership	162
Civil Engineering with Concentration in Construction Management, MSCivE	126	Engineering Leadership, Graduate Certificate	163
Civil Engineering with Concentration in Environmental and Water Systems, MSCiVE	128	Engineering Management	164
Civil Engineering with Concentration in Geotechnical/ Geoenvironmental Engineering, MSCivE	129	Engineering Management, MSEM	165
Civil Engineering with Concentration in Structural Engineering, MSCivE	130	Engineering Management Graduate Certificates	167
Civil Engineering with Concentration in Transportation, MSCivE	132	Engineering Business, Graduate Certificate	167
Engineering and Public Policy with Concentration in Energy & Environment, MS	133	Engineering Management, Graduate Certificate	167
ENGINEERING AND PUBLIC POLICY WITH CONCENTRATION IN INFRASTRUCTURE RESILIENCE, MS	134	Technology Systems Management, Graduate Certificate	168
Environmental Engineering, MSENVE	136	Engineering Economic Decision Making Graduate Certificate	168
Computer Systems Engineering	137	Supply Chain Engineering Management, Graduate Certificate	168
Computer Systems Engineering with Concentration in Software Design Engineering, MSCSE	138	Lean Six Sigma Graduate Certificate	169
Computer Systems Engineering, Graduate Certificate	139	Industrial Engineering	169
Electrical and Computer Engineering	139	Industrial Engineering, PhD	170
Computer Engineering, PhD	141	Industrial Engineering, PhD—Advanced Entry	172
Computer Engineering, PhD—Advanced Entry	141	Industrial Engineering, MSIE	175
Electrical Engineering, PhD	141	Data Mining Engineering, Graduate Certificate	177
Electrical Engineering, PhD—Advanced Entry	142	Information Assurance	177
Electrical and Computer Engineering with Concentration in Communications, Control, and Signal Processing, MSECE	142	Information Systems	177
Electrical and Computer Engineering with Concentration in Computer Systems and Software, MSECE	144	Information Systems, MSIS	178
Electrical and Computer Engineering with Concentration in Computer Networks and Security, MSECE	146	Interdisciplinary Engineering PhD Program	179
Electrical and Computer Engineering with Concentration in Computer Vision & Machine Learning, MSECE	149	Mechanical Engineering	179
Electrical and Computer Engineering with Concentration in Electromagnetics, Plasma, and Optics, MSECE	151	Mechanical Engineering, PhD	180
Electrical and Computer Engineering with Concentration in Microsystems, Materials, and Devices, MSECE	153	Mechanical Engineering, PhD—Advanced Entry	183
Electrical and Computer Engineering with Concentration in Power Systems, MSECE	155	Data Analytics Engineering, MS	185
Electrical and Computer Engineering Leadership, MSECEL	157	Mechanical Engineering with Concentration in General Mechanical Engineering, MSME	188
Energy Systems	158	Mechanical Engineering with Concentration in Mechanics and Design, MSME	190
		Mechanical Engineering with Concentration in Material Science, MSME	191
		Mechanical Engineering with Concentration in Mechatronics, MSME	193
		Mechanical Engineering with Concentration in Thermofluids, MSME	195
		Operations Research	197

Operations Research, MSOR	198	Health Informatics Management and Exchange Graduate Certificate	222
Sustainable Building Systems	200	Health Informatics Privacy and Security, Graduate Certificate	222
Sustainable Building Systems, MSSBS	200	Health Informatics Software Engineering Graduate Certificate	222
Telecommunications Systems Management	202	School of Nursing	222
Telecommunications Systems Management, MSTSM	202	Nursing, PhD	223
Telecommunication Systems Management Graduate Certificates	204	Nursing, PhD—Advanced Entry	224
Broadband Wireless Systems, Graduate Certificate	204	Nursing Practice, DNP	224
IP Telephony Systems, Graduate Certificate	204	Nursing Practice with Concentration in Nurse Anesthesia, DNP	225
Bouvé College of Health Sciences	206	Nursing—Adult-Gerontology Nurse Practitioner, Acute Care, CAGS	225
Academic Policies and Procedures	206	Nursing—Adult-Gerontology Nurse Practitioner, Primary Care, CAGS	226
Health Certification	206	Nursing—Family Psychiatric Nurse Practitioner, CAGS	226
Practicum/Internship Policies	206	Nursing—Neonatal Nurse Practitioner, CAGS	226
Background Checks	207	Nurse Anesthesia, CAGS	227
Liability Insurance	207	Nursing—Pediatric Nurse Practitioner, Acute Care, CAGS	227
Grading	207	Nursing—Pediatric Nurse Practitioner, Acute and Primary Care, CAGS	227
Transfer of Credit	207	Nursing—Pediatric Nurse Practitioner, Primary Care, CAGS	228
Course Waiver	207	Nursing—Adult-Gerontology Nurse Practitioner, Acute Care, MS	228
Academic Progression	208	Nursing—Adult-Gerontology Nurse Practitioner, Primary Care, MS	229
Student's Academic Standing	208	Nursing—Family Psychiatric Nurse Practitioner, MS	229
Academic Probation Policy	208	Nursing—Family Nurse Practitioner, Primary Care, MS	230
Applied Psychology	208	Nursing—Neonatal Nurse Practitioner, MS	230
Counseling Psychology, PhD	209	Nursing—Pediatric Nurse Practitioner, Acute and Primary Care, MS	230
School Psychology, PhD	210	Nursing—Pediatric Nurse Practitioner, Primary Care, MS	231
Applied Behavior Analysis, CAGS	211	Nursing—Direct Entry, MS	231
Counseling Psychology, CAGS	212	Nursing Administration, MS	232
Applied Behavior Analysis, MS	212	Nursing Anesthesia, MS	232
College Student Development and Counseling, MS	213	Nursing and Business Administration, MS/MBA	233
Counseling Psychology, MSCP	213	School of Pharmacy	234
School Psychology, MS/CAGS	214	Biomedical Sciences, PhD	235
Applied Behavior Analysis, Graduate Certificate	215	Medicinal Chemistry, PhD	235
Early Intervention, Graduate Certificate	215	Pharmaceutical Sciences, PhD	236
Communication Sciences and Disorders	216	Pharmacology, PhD	236
Audiology, AuD	216	Pharmacy, PharmD	237
Speech-Language Pathology, MS	217	Pharmacy, PharmD—Direct Entry	237
Health Sciences	217	Biomedical Nanotechnology, MS	240
Population Health, PhD	218	Biomedical Sciences, MS	240
Public Health, MPH	219		
Exercise Science with Concentration in Physical Activity and Public Health, MS	220		
Health Data Analytics, MS	92		
Health Informatics, MS	221		
Pharmacy and Public Health, PharmD/MPH	221		

Medicinal Chemistry, MS	241	Student Evaluation of Courses (EvaluationKit)	261
Pharmaceutical Sciences, MS	241	Academic Progression Standards	262
Pharmacology, MS	241	Reinstatement after Academic Dismissal	262
Pharmacy and Public Health, PharmD/MPH	221	Completing Degree Requirements	262
Physical Therapy, Movement, and Rehabilitation Sciences	243	Degrees, Majors, and Concentrations	263
Disability Studies, Graduate Certificate	244	Seeking more than One Certificate or Degree	263
Occupational Ergonomics and Health, MS	244	Graduation Requirements	264
Physical Therapy, DPT	245	Global Partnership Programs	264
Physical Therapy, DPT—Direct Entry	245	Accommodations for Students with Disabilities	264
Physician Assistant	247	Personal Information	264
Physician Assistant Studies, MS	247	Graduate Campus	264
Physician Assistant Studies and Public Health, MS/MPH	248	Doctoral Degree Programs	265
Interdisciplinary	249	Education, EDD	265
Personal Health Informatics, PhD	249	Law And Policy, DLP	267
Biotechnology, MS	249	Transitional Doctor of Physical Therapy, DPT	267
Health Informatics, MS	93	Transitional Doctor of Physical Therapy, DPT—Direct Entry ...	268
Health Informatics, MS—ALIGN Program	94	Master's Degree Programs	269
Aging, Graduate Certificate	252	Homeland Security, MA	269
Biopharmaceutical Analytical Science, Graduate Certificate	252	Teaching, Elementary Licensure, MAT	270
Early Intervention, Graduate Certificate	215	Teaching, Secondary Licensure, MAT	271
Health Informatics Management and Exchange, Graduate Certificate	253	Education, MEd	272
Health Informatics Privacy and Security, Graduate Certificate	253	Digital Media, MPS	274
Health Informatics Software Engineering, Graduate Certificate	253	Geographic Information Technology, MPS	275
Law and Urban Public Health, JD/MPH	254	Informatics, MPS	277
School of Law	255	Applied Nutrition, MS	278
Legal Studies, MS—Online	255	Commerce and Economic Development, MS	278
College of Professional Studies	257	Corporate and Organizational Communication, MS	279
Academic Policies and Procedures	257	Criminal Justice, MS	280
Master's Degree Admission Requirements	257	Global Studies and International Relations, MS	283
Transfer Credit Policies	257	Human Services, MS	286
Special Student Status	257	Leadership, MS	287
Personal Professional Enrichment (PPE)	258	Nonprofit Management, MS	288
New Student Orientation (On-Ground and Online)	258	Project Management, MS	290
Academic Resources	258	Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Clinical Research Regulatory Affairs, MS	291
Attendance Requirements	258	Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in General Regulatory Affairs, MS	292
Reentry to Program	259	Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in International Regulatory Affairs, MS	293
Readmission to Program	259	Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Operational Regulatory Affairs, MS	294
Full-Time Status	259	Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Regulatory Compliance, MS	295
Active-Duty Military Personnel	260	Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Strategic Regulatory Affairs, MS	296
Registration and Taking Courses	260		

Regulatory Affairs of Food and Food Industries, MS	297	Respiratory Specialty Practice, Graduate Certificate	314
Respiratory Care Leadership, MS	298	Social Media and Online Communities, Graduate Certificate	314
Technical Communication, MS	298	Teaching English To Speakers Of Other Languages, Graduate Certificate	314
Sports Leadership, MSLD	299	College of Science	316
Graduate Certificate Programs	300	Academic Policies and Procedures	316
3-D Animation, Graduate Certificate	300	Grading Policies	316
Adult and Organizational Learning, Graduate Certificate	301	Course Registration	316
Advanced Study of Orthopedics, Graduate Certificate	301	Transfer Credit	316
Collegiate Athletics Administration, Graduate Certificate	301	Awards	316
Construction Management, Graduate Certificate	302	Satisfactory Progress	316
Digital Media Management, Graduate Certificate	302	Time Limitation	317
Digital Video, Graduate Certificate	302	Changes in Requirements	317
Biopharmaceutical Domestic Regulatory Affairs, Graduate Certificate	303	The Doctor of Philosophy Degree (PhD)	317
e-Learning and Instructional Design, Graduate Certificate	303	The Master's Degree Academic Requirements	318
Financial Markets and Institutions, Graduate Certificate	303	Biology	318
Forensic Accounting, Graduate Certificate	304	Biology, PhD	318
Game Design, Graduate Certificate	304	Biology, PhD—Advanced Entry	319
Geographic Information Systems, Graduate Certificate	304	Bioinformatics, MS	319
Global Student Mobility, Graduate Certificate	305	Bioinformatics, MS—ALIGN Program	320
Global Studies and International Relations, Graduate Certificate	305	Chemistry and Chemical Biology	321
Health Management, Graduate Certificate	306	Chemistry, PhD	321
Higher Education Administration, Graduate Certificate	306	Chemistry, PhD—Advanced Entry	322
Human Resources Management, Graduate Certificate	306	Biotechnology, MS	249
Information Security Management, Graduate Certificate	307	Chemistry, MS	323
Interactive Design, Graduate Certificate	307	Biopharmaceutical Analytical Science, Graduate Certificate	252
Interdisciplinary Professional Studies, Graduate Certificate	307	Marine and Environmental Sciences	324
International Biopharmaceutical Regulatory Affairs, Graduate Certificate	309	Ecology, Evolution, and Marine Biology, PhD	324
Leadership, Graduate Certificate	309	Ecology, Evolution, and Marine Biology, PhD—Advanced Entry	324
Leading And Managing Technical Projects, Graduate Certificate	309	Marine Biology, MS—Three Seas Program	325
Learning Analytics, Graduate Certificate	310	Mathematics	326
Medical Devices Regulatory Affairs, Graduate Certificate	310	Mathematics, PhD	326
Nonprofit Management, Graduate Certificate	311	Mathematics, PhD—Advanced Entry	329
Organizational Communication, Graduate Certificate	311	Applied Mathematics, MS	331
Port Security, Graduate Certificate	311	Mathematics, MS	331
Professional Sports Administration, Graduate Certificate	312	Operations Research, MSOR	332
Program and Portfolio Management, Graduate Certificate	312	Physics	332
Project Management, Graduate Certificate	312	Physics, PhD	333
Public and Media Relations, Graduate Certificate	313	Physics, PhD—Advanced Entry	335
Remote Sensing, Graduate Certificate	313	Physics, MS	338
		Psychology	339

Psychology, PhD	339	Law and Public Policy, JD/MS	369
Psychology, PhD—Advanced Entry	340	Sociology	370
Interdisciplinary	341	Sociology, PhD	370
College of Social Sciences and Humanities	342	Sociology, PhD—Advanced Entry	372
School of Criminology and Criminal Justice	342	Sociology, MA	374
Criminology and Justice Policy, PhD	342	Interdisciplinary	374
Criminology and Justice Policy, PhD—Advanced Entry	343	Network Science, PhD	374
Criminal Justice, MSCJ	344	Data Analytics, Graduate Certificate	100
Global Criminology, Graduate Certificate	344	Digital Humanities, Graduate Certificate	350
English	345	Women’s, Gender, and Sexuality Studies, Graduate Certificate	376
English, PhD	345	University Faculty	378
English, PhD—Advanced Entry	347	Appendix	414
English, MA	348	Governing Boards and Officers of Northeastern	414
Digital Humanities, Graduate Certificate	350	University Leadership	415
History	350	Statements of Accreditation	416
History, PhD	351	Institutional Calendars and Online Resources	418
History, PhD—Advanced Entry	351	General Information	418
History, MA	352	Index	420
Public History, Graduate Certificate	353		
Political Science	353		
Political Science, PhD	353		
Political Science, PhD—Advanced Entry	354		
Political Science, MA	355		
Public Administration, MPA	357		
Security and Resilience Studies, MS	358		
Security and Resilience Studies, Graduate Certificate	359		
Economics	359		
Economics, PhD	360		
Economics, PhD—Advanced Entry	360		
Economics, MA	361		
School of Public Policy and Urban Affairs	361		
Law and Public Policy, PhD	362		
Law and Public Policy, PhD—Advanced Entry	363		
International Affairs, MA	363		
Public Administration, MPA	357		
Public Policy, MPP	366		
Urban Informatics, MS	367		
Urban and Regional Policy, MS	367		
Public Policy Analysis, Graduate Certificate	368		
Nonprofit Sector, Philanthropy, and Social Change, Graduate Certificate	368		
Urban Informatics, Graduate Certificate	369		
Urban Studies, Graduate Certificate	369		

General Admission and Transfer Credit

- Regulations Applying to All Degree Programs (p. 8)
- Regulations Applying only to Doctor of Philosophy (PhD) Programs (p. 9)
- General Regulations and Requirements for Nondegree Certificate Programs (p. 9)
- General Regulations and Requirements for the Master's Degree (p. 9)
- General Regulations and Requirements for the Certificate of Advanced Graduate Study (p. 10)
- General Regulations and Requirements for the Research Doctorate (PhD and EdD) (p. 10)
- General Regulations and Requirements for Interdisciplinary Graduate Degrees (p. 11)

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 (<http://www.northeastern.edu/provost/policies/graduate.html>) 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. 257) 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 in 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 in 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. 9). 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. 9). 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 (p. 13)
- Information for International Students (p. 13)
- Academic Resources (p. 14)
- Information Technology Services (p. 15)
- Campus Resources (p. 16)

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 Graduate Student Life website (<http://www.northeastern.edu/graduatestudentlife>).

Off Campus Student Services

226 Curry Student Center

617.373.8480

offcampus@northeastern.edu

Website (<http://www.northeastern.edu/offcampus>)

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

405 Ell Hall

617.373.2310

617.373.8788 (fax)

Website (<http://www.northeastern.edu/ogs>)

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 web page (<http://www.northeastern.edu/uhs>) 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 (p. 14)
- Office of the Registrar (p. 15)

Libraries

Northeastern University Libraries

617.373.8778

Website (<http://www.library.northeastern.edu>)

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 thirty 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 web page (<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

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

Help and Information Desk, Snell Library

617.373.4357 xHELP

help@northeastern.edu

The ITS Service Desk provides phone-based and walk-up technology support services to students, faculty, and staff. The ITS Service Desk 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 students with myNEU and Blackboard questions
- Support with ITS-managed labs
- Access to equipment available for loan including AV equipment, and laptop adapters

The ITS Service Desk is located at the Help and Information Desk on the first floor of Snell Library near the InfoCommons and provides assistance on computer-related issues to students, faculty, and staff with a valid Northeastern ID.

myNEU

Website (<http://myneu.neu.edu>)

myNEU—the online portal for the Northeastern community—is a central resource for students, faculty, and staff. 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.

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

Website (<http://www.northeastern.edu/resnet>)

ResNet—a service of Information Technology Services 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 TV 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 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 to remotely print. When you locate a printer associated with the appropriate printing queue, simply swipe your Husky Card, select your print job, and it will print.

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 web page (<http://www.northeastern.edu/aup>).

Training Services

Snell Library
617.373.5858
training@northeastern.edu

Information Technology Services training provides the following instructor-led and web-based courses to all members of the Northeastern community:

- **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.
- **Instructor-led training** includes classes such as Public Speaking for Presentations, Advanced Excel, SharePoint, Adobe Photoshop, and Blackboard. These workshops are available at no charge to the entire university community.

To register for a class, visit the training section of the ITS website.

Academic Technology Services (ATS)

212 Snell Library
Website (<http://www.ats.neu.edu>)
ats@northeastern.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 Services (p. 16)
- Campus Recreation (p. 16)
- Center for Advancing Teaching and Learning Through Research (p. 16)
- Disability Resource Center (p. 17)
- Graduate Student Government (p. 17)
- Husky Card Services (p. 17)
- John A. and Marcia E. Curry Student Center (p. 18)
- Northeastern University Bookstore (p. 18)
- Parking (p. 18)
- Public Safety (p. 18)
- University Health and Counseling Services (p. 19)

- We Care (p. 19)

Career Services

103 Stearns Center
617.373.2430
617.373.4231 (fax)
careerservices@northeastern.edu
Website (<http://www.northeastern.edu/careerservices>)

Career Services 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 Services 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 supports graduate students at Northeastern University in their roles as teaching assistants, instructors, and future faculty. We provide a range of opportunities for graduate students to develop their teaching practices in

ways that enhance student learning and that are grounded in the learning sciences research. The center offers:

- Workshops in which graduate students explore specific topics in teaching and learning
- Classroom observations and student focus groups in which graduate students receive and reflect on feedback on their teaching
- One-on-one consultations in which graduate students can discuss any aspect of teaching and learning, such as writing a teaching statement and designing teaching materials and activities
- Future Faculty Program for Teaching in Higher Education in which graduate students prepare for the teaching responsibilities of a faculty career

All of the center's services are provided on a formative and confidential basis. While we work with and provide feedback to graduate students as they design teaching materials and reflect on their own practices, we do not evaluate graduate students. Furthermore, we do not provide any information about feedback and consultation services, or even that such a service was provided, without the express consent of the graduate student who has used these services.

Disability Resource Center

20 Dodge Hall
617.373.2675
617.373.7800 (fax)
617.373.2730 (TTY)
Website (<http://www.northeastern.edu/drc>)

The Disability Resource Center (DRC) strives to create an environment in which all are empowered to make their unique contributions to the rich academic and social life of Northeastern. Its staff takes a creative approach to assisting students who have disabilities or who are Deaf or hard of hearing by providing services that will enable them to succeed.

In accordance with federal laws and guidelines, services cannot be provided unless acceptable documentation is submitted to the DRC. Students must provide recent diagnostic documentation indicating that the disability substantially limits one or more major life activities. They must also register with the DRC and meet with a counselor.

Students who are disabled, Deaf, or hard of hearing are strongly encouraged to contact the DRC upon their acceptance to Northeastern. It is also most beneficial to schedule a meeting with a DRC counselor at least three months prior to arriving on campus in order to register and request services. Early contact with the center will allow enough time to assemble the required diagnostic documentation, register at the DRC, and set up services.

Services are individually tailored on a case-by-case basis to meet each student's needs. Support services are available for, but are not limited to, students with a documented diagnosis of learning disabilities, blindness or visual disabilities, mobility disabilities, deafness or hard of hearing disability, head injuries, psychiatric disorders, degenerative or chronic conditions, HIV-positive status or AIDS, and temporary disabilities.

The center's services include examination modification and accommodation; disability-related academic advising and course modification; note-taking services; readers and scribes; sign-language interpreters and transliterators; computer-aided, real-time information about classrooms' accessibility; advising and referral services; campus orientations; acquisition of assistive listening devices, Braille materials, taped textbooks, and raised-line drawings; and assistive technology,

such as the Reading Edge machine. The center also provides liaison, advocacy, and training services for faculty, staff, and administration and coordinates special-interest groups.

DRC does not provide personal care assistance (PCA) services; the center will provide referral to local PCA service agencies, such as the Boston Center for Independent Living (<http://www.bostoncouncil.org>).

Northeastern does not offer transportation services; however, public transportation in greater Boston is run by the Massachusetts Bay Transportation Authority (MBTA), which offers a curb-to-curb transportation service known as The Ride for persons with disabilities. Several stops on the Orange Line branch of the MBTA subway system are very convenient to the Northeastern campus. See the MBTA website (<http://www.mbta.com>) for more information.

Graduate Student Government

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

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@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

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

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
Website (<http://www.northeastern.edu/parking>)

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.

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 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 ten to fifteen 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

Forsyth Building, Suite 135
617.373.2772
UHCS@northeastern.edu
Website (<http://www.northeastern.edu/uhrs>)

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, deshy;pressed, or stressed.

We Care

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

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.

- Tuition and Fees (p. 20)
- Student Refunds (p. 20)
- Financial Aid Assistance (p. 21)
- Bill Payment (p. 23)

Tuition and Fees

Tuition

Graduate Program	Cost per Credit Hour
Applied Behavioral Analysis	\$1,054
Arts, Media and Design	\$1,365
Audiology (AuD) (per term)	\$11,925
Audiology (AuD) clinical (per term)	\$8,858
Biotechnology, Bioinformatics, Applied Math	\$1,395
Bouvé College of Health Sciences	\$1,388
Business Administration, including online graduate programs	\$1,513
College of Professional Studies— Doctorate in Education	\$767
College of Professional Studies— Graduate on campus and online (excluding MEd and MAT)	\$646
College of Professional Studies— MEd and MAT programs	\$530
Computer and Information Science	\$1,495
Engineering	\$1,471
Health Informatics	\$1,212
Marine Biology	\$1,215
MS in Accounting	\$1,520
MS in Innovations	\$1,617
MS/MBA (full program)	\$64,593
Nurse Anesthetist clinical (in addition to tuition)	\$3,467
Nursing, direct entry (per term)	\$16,626
Physical Therapy— postbaccalaureate direct entry (DPT) (per semester)	\$15,981
Physical Therapy— postbaccalaureate direct entry (DPT) clinical (per semester)	\$10,996
Physician Assistant (per term)	\$13,823
RN to BSN online	\$764
Science	\$1,375
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 (<http://www.northeastern.edu/financialaid/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. 24)). 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 (<http://www.northeastern.edu/uahcs>) website. 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 (<http://www.northeastern.edu/financialaid/policies>) website.

Financial Aid Assistance

Student Financial Services

354 Richards Hall

617.373.5899

617.373. 2897 (College of Professional Studies)

sfs@northeastern.edu

Website (<http://www.northeastern.edu/financialaid>)

Northeastern University is eager to assist students in developing a plan for financing a Northeastern education. Through a variety of options—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 Office of Student Financial Services (<http://www.northeastern.edu/financialaid>) on the web or call 617.373.5899 for additional information.

Federal Financial Aid

For many students, financial aid is a major element in making Northeastern University affordable. The Office of Student Financial Services is committed to working with you to identify federal financial aid options that can help make a Northeastern education affordable. To take advantage of 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, visit the myNEU web portal (<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 Registrar's (<http://www.northeastern.edu/registrar/ref-udc-fulltime.pdf>) website
- Be citizens or eligible noncitizens of the United States
- Be matriculated in a degree-granting program
- Have received 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.

You will need your Department of Education PIN to electronically sign your FAFSA online. If you do not have one or have forgotten your PIN, go to the Federal Student Aid (<http://www.PIN.ed.gov>) 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 who have met the March 1 priority filing deadline 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 Unsubsidized Stafford Loan, assuming that all eligibility requirements have been met.

For more information about Stafford loans, visit the Student Financial Services (<http://www.northeastern.edu/financialaid/aid/graduate/typesofaid>) webpage.

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 (<http://www.northeastern.edu/financialaid/aid/graduate/typesofaid>) webpage.

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 nine-month grace period prior to repayment following graduation, withdrawal, or a drop below half-time status. The grace period is twelve months for Health Professions Student Loans. Repayment on the loan is for a period of up to ten years with a minimum forty 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 full-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 grad PLUS loan. The grad PLUS loan can be consolidated with federal Stafford and Perkins loans upon graduation.

Grad 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 graduate PLUS loan through the student portal by clicking on the "Federal Graduate PLUS Loan Application" link under the "Self-Services" 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 (<http://www.northeastern.edu/financialaid/financingoptions>).

Supplemental Student Loans

There are a number of attractive 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 (<http://www.northeastern.edu/financialaid/financingoptions.html>). 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 assistance based upon information brought to the office's attention subsequent to extension of the offer, including things such as 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 outside sources of financial aid may require that financial aid offered by Northeastern needs to be adjusted.

REAPPLICATION PROCESS

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

Students should not wait to file an income tax return before completing the FAFSA but use estimated information.

SATISFACTORY ACADEMIC PROGRESS

To continue receiving financial aid, graduate students need to maintain the academic requirements for satisfactory progress set forth by their college. Refer to the Student Financial Services website (<http://www.northeastern.edu/financialaid/policies>) for more information about how satisfactory progress affects financial aid.

VERIFICATION

If a student is selected for verification, the Student Financial Services office is required to collect 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 (<http://www.northeastern.edu/financialaid/financingoptions>).
- Additional payment options and details can be found at the Student Financial Services website (<http://catalog.northeastern.edu/graduate/expenses/bill-payment/%20http://www.northeastern.edu/financialaid/financingoptions.html>).

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

In those situations where the tuition is paid directly to the university by a third party, the student must provide Student Accounts with a purchase order or a written statement of intent to pay by the third party. 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. Address correspondence to:

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 (p. 24)
- Academic Calendars (p. 25)
- Student Records and Transcripts (p. 26)
- Final Examinations and Related Policies on Other Exams (p. 29)
- Graduation Requirements (p. 29)
- Family Educational Rights and Privacy Act (FERPA) (p. 29)
- Student Right-to-Know Act (p. 30)
- Code of Student Conduct (p. 30)
- Appeals Policies and Procedures (p. 30)
- General Regulations (p. 32)
- Students' Bill of Academic Rights and Responsibilities (p. 38)

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 make-up 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 make-up 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 Residential Life and Housing for policy information.
- Students' enrollment status cannot include more than one academic year of consecutive nonclass enrollments.
- After the eleventh 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 web page (<http://www.northeastern.edu/uahcs/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, 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 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 twelve 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 grade-point-average 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 Grade-Point Average

Grades submitted to satisfy, in whole or in part, the requirements for any graduate degree or certificate of advanced study must yield a cumulative grade-point average 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 grade-point average 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 grade-point average.

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 the

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 eighteen 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

Directory information: Information that can be released to third parties without the prior consent of the student, unless the student specifically requests otherwise in accordance with the Office of the University Registrar's procedures. Although directory information may be released unless the student has notified the Office of the University Registrar otherwise, Northeastern considers each request on an individual basis.

Northeastern treats the following as directory information (the office listed has the most accurate and up-to-date information):

Office of the University Registrar

- 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

Department of Athletics

- Sports activity participation, showing weight/height of members of athletic teams

Center for Student Involvement

- Participation in officially recognized activities

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 forty-five 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, DC 20202-5920

FERPA and the USA Patriot Act

The USA Patriot Act preempts FERPA, described above. The act provides federal law enforcement agencies access to otherwise confidential

student records upon the presentation of specified authority. The act also says that the university cannot notify the individual whose records or information is being sought that the request has been made. All requests for student information made under the authority of the USA Patriot Act are handled by the Office of the General Counsel, 716 Columbus Avenue.

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 EII) 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.

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

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.

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 non-university 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 twelve-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. 30)." 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 Student Services Office

122 Meserve Hall

617.373.5329

gscamd@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 (p. 40)
- Master’s Degree Policies (p. 40)
- Graduate Student Classification (p. 41)

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. Departments and programs may have additional requirements that exceed those of the college (departmental handbooks can be found at the college’s web page (<http://www.northeastern.edu/camd/academics/graduate/current-students>)).

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. 26)”).

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.

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 will generally have a 3.000 GPA. Students whose cumulative GPA is below 3.000 will be reviewed by their departments and by CAMD graduate studies and may have their funding terminated on recommendation of their department or by decision of CAMD graduate studies in consultation with their department. Renewals of awards depend on the student making satisfactory academic progress toward the degree and satisfactory performance of any duties required by the award.

Leave of Absence

Full-time students who are not involved in any academic endeavor for a period of time are required to petition the coordinator 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/uhrs/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 International Student and Scholar Institute 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 Master's 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 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 (<http://www.northeastern.edu/camd/academics>). 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>)

Peter H. Wiederspahn, M.Arch
Graduate Director

151 Ryder Hall
617.373.4637
617.373.7080 (fax)
architecture@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. 42)
- Two-Year Program (p. 42)
- Three-Year Program (p. 43)
- Three-Year Program—Advanced Degree Entrance (p. 44)

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

- One-Year Program (p. 45)
- Two-Year Program (p. 46)

Combined Programs

- One-Year Master of Architecture and Sustainable Urban Environments (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 BS 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 BS 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

In the urban housing studio, students have an opportunity to learn to develop new patterns of housing for specific Boston sites and to develop those sites with their own individual interventions. The comprehensive design studio challenges the students to consider

architectural connections at all scales, from the nut and bolt to the scale of the door or window to the scale of the whole building and the city. Additionally, students can opt to study abroad in our Berlin program their first semester.

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 5110	Housing and Aggregation	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

In consultation with your faculty advisor, complete 8–16 semester hours from outside the following subject area:

ARCH	8-16
------	------

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	Total
ARCH 5110 (or)	6	ARCH 5120	6	Vacation	0	Vacation	0	0
ARCH 315 ¹	4	ARCH 5220	4					
Elective (Required/ or)	4	ARCH 5210	4					

ARCH 336: Elective (Optional)	4				
ARCH 5310 (or)	4				
ARCH 336: Elective (Required/ or)	4				
GRMN 110					
	18	18	0	0	

Total Hours: 68

*Berlin curriculum

Master of Architecture—Three-Year Program

Open to candidates who do not have a BS 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

In the second-year studios, students have an opportunity to learn to develop new patterns of housing for specific Boston sites and to develop those sites with their own individual interventions. Students also have the option to study abroad at the school's Berlin program during the fall. The comprehensive design studio challenges the students to consider architectural connections at all scales, from the detail, to building systems, to the whole building, and ultimately to an architecture situated in an urban and climatological context. Additionally, students take building technology and architecture seminar courses.

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), Housing and Aggregation (ARCH 5110), and Structural Systems (ARCH 2230).
- 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 2230	Structural Systems	4
or ARCH 3362	Seminar Abroad	
ARCH 2240	Architectonic Systems	4
ARCH 3450	Advanced Architectural Communication	4
ARCH 5210	Environmental Systems	4
or ARCH 3362	Seminar Abroad	
ARCH 5220	Integrated Building Systems	4

Studio

ARCH 5110	Housing and Aggregation	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
ARCH 6340	Graduate Topics in Architecture	4

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. 4

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	4	ARCH 6200	6	Vacation	0
ARCH 6100	6	ARCH 5210	4		
ARCH 2240	4	ARCH 5310	4		
Elective (Required)	4	Elective (Required)	4		
		18			18
				0	0

Year 2

Fall	Hours	Spring	Hours
ARCH 2230 (or)	4	ARCH 3450	4
ARCH 336		ARCH 5120	6
ARCH 5110 (or)	6	ARCH 5220	4
ARCH 315		ARCH 6340 (1 of 2)	4
ARCH 2340 (or)	4		
ARCH 336			
Elective (Optional or)	4		
GRMN 11C			
		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

*Berlin curriculum

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

Open to candidates who do not have a BS in Architecture or equivalent but may have related 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 2230	Structural Systems (or or ARCH 3362 Seminar Abroad)	4
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 6340	Graduate Topics in Architecture (repeatable course to be taken twice)	8
ARCH 6330	Seminar in Modern Architecture	4

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 6100	6	ARCH 6200	6
ARCH 2330 (and)	4	ARCH 5210	4
ARCH 2331		ARCH 5310	4
ARCH 2240	4	Elective (required)	4
Elective (required)	4		
			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 2340 (or)	4		
ARCH 3361			
Elective (optional or)	4		
GRMN 1101			
			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

Total Hours: 104

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

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

SUEN 7320	Pro-Seminar: Issues in Designed Urban Environments	4
or 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
SUEN 6340	Topics in Urban Environmental Design	4
SUEN 7320	Pro-Seminar: Issues in Designed Urban Environments	4
or SUEN 6340	Topics in Urban Environmental Design	
LPSC 7312	Cities, Sustainability, and Climate Change	3
LPSC 8400	Planning Module in Urban Law and Policy	1

Techonology

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.

Master of Architecture and Sustainable Urban Environments—Combined Program

This three semester combined Master of Architecture¹ and Sustainable Urban Environments¹ degree creates the ability for M.Arch¹ students to satisfy the requirements for both the Architecture¹ and Sustainable Urban Environments¹ in three semesters instead of the standard four. This combined program allows expedited completion of a degree in complementary fields. This program option is only open to M.Arch¹ students.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Program Requirements

Year One, Fall

ARCH 6430	Case Studies 1	4
ARCH 7130	Master's Research Studio	6
SUEN 6310	Cities, Nature, and Design in Contemporary History and Theory	4
SUEN 6210	Implementation and Visualization for Urban Environments 1	4
or SUEN 7320	Pro-Seminar: Issues in Designed Urban Environments	

Year One, Spring

ARCH 6440	Case Studies 2	4
ARCH 7140	Master's Degree Project	6
SUEN 6210	Implementation and Visualization for Urban Environments 1	4
or SUEN 7240	Urban Ecologies and Technologies 2	
SUEN 7320	Pro-Seminar: Issues in Designed Urban Environments	4

Year Two, Fall

SUEN 7130	Master's Research Studio: Design and the Resilient City	6
<i>Choose 3 electives in consultation with faculty:</i>		12
ARCH, SUEN		

Program Credit/GPA Requirements

54 total semester hours required

Minimum 3.000 GPA required

Art + Design

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

Andrea Raynor, MFA
Interim Chair

239 Ryder Hall

617.373.2347

617.373.8535 (fax)

Judy Ulman, Administrative Assistant, j.ulman@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>)

Alessandro Canossa, PhD

Associate Professor and Game Graduate Coordinator

100 Meserve Hall

617.373.5242

www.northeastern.edu/camd/gamesdesign (<http://www.northeastern.edu/camd/gamesdesign>)

www.northeastern.edu/camd/gamesdesign

Sarah Kanouse, MFA

Associate Professor and Interdisciplinary Arts Graduate Coordinator

319 Ryder Hall

617.373.6371

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)

- Information Design and Visualization (p. 47)
- Interdisciplinary Arts (p. 48)
- Studio Arts—School of the Museum of Fine Arts (p. 48)

Graduate Certificate

- Arts Management and Cultural Entrepreneurship (p. 50)

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.

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 electives list below, including courses from data science (DS): 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 Information Design	
DS 6020		
DS 6030		
PPUA 6301	Introduction to Computational Statistics	

Thesis

A thesis project is required for this program:

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	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 core critique seminar, Arts in the Public Sphere Seminar 1 (ARTD 5001), providing 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 Arts in the Public Sphere is required each term. The format of the course is critique-seminar.		8
ARTD 5001	Arts in the Public Sphere Seminar 1	
ARTD 5002	Arts in the Public Sphere Seminar 2	
ARTD 6001	Arts in the Public Sphere Seminar 3	
ARTD 6002	Arts in the Public Sphere Seminar 4	

Studio Electives

Complete 24 semester hours from the following:	24
ARTD 5101	Interactive Media Arts 1
ARTD 5202	Photographic Media in Cultural Context
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 5330	Visualization Technologies
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 12 semester hours 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 6210	Theoretical Approaches to the Visual Arts
ARTE 6211	Art Criticism by Artists

Research, Thesis, and Exhibition

Research

ARTD 5301	Independent Research Project 1	4
ARTD 6301	Independent Research Project 2	4

Thesis and Exhibition

A thesis project is required for this program.

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

Year 1

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

Year 2	Fall	Hours	Spring	Hours
ARTD 6001	2	ARTD 6002	2	
ARTD 6301	4	ARTE 7990	4	
ARTE 7100	4	Studio elective	4	
History, theory, and critical studies elective	4			
Studio elective	4			
	18		10	

Total Hours: 64

Studio Arts—School of the Museum of Fine Arts, MFA

The **Master of Fine Arts in Studio Arts** is offered in conjunction with the School of the Museum of Fine Arts, Boston (<http://www.smfa.edu>) (SMFA, Boston), adjacent to the Northeastern campus. The SMFA, Boston is part of the Museum of Fine Arts, Boston, one of the most comprehensive art museums in the world, with a collection of nearly 450,000 works of fine art. Rigorous and highly selective, the studio art program seeks to prepare students for a career as a working artist or a faculty at the college level.

Students hone their practices through individual innovation, creative collaborations, informal mentorship, and academic discourse. Students are enrolled at both Northeastern University and the SMFA, Boston and graduate in two years with an MFA degree from Northeastern. Course work includes 44 semester hours of studio work and graduate seminars at SMFA, Boston and 16 hours of art history and academic electives at Northeastern. Students receive semiprivate studio spaces at the SMFA, Boston and access to SMFA, Boston faculty and equipment. A final thesis exhibition is required. This program is designed to prepare students for careers in art, museums, and cultural institutions. Students will also be well positioned to pursue academic careers.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Choose course work in consultation with the School of the Museum of Fine Arts and Northeastern University faculty.

Requirements

Studio Electives
Complete 8 semester hours of studio art course work. 8

Nonstudio Electives
Courses are selected under advisement of the graduate coordinator or faculty advisor. Courses may be from Art + Design or other colleges: 8

ARTH 5100	Contemporary Art Theory and Criticism
ARTH 5200	Issues in Contemporary Art
ARTS 5100	Visual Ideation

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 6212	The History of the Avant-Garde
ARTH 6901	Special Topics in Contemporary Art

Thesis/Exhibition

Complete thesis requirement.

School of the Museum of Fine Arts Courses

Complete 44 semester hours of SMFA courses.	44
SMFA 6000	Museum of Fine Arts Studio 1-12

Program Credit/GPA Requirements

60 total semester hours required

Minimum 3.000 GPA required

Plan of Study**Year 1**

Fall	Hours	Spring	Hours
SMFA 6000	12	SMFA 6000	12
Northeastern course	4	Northeastern course	4
End of semester review board	0	Establish thesis exhibit committee	0
		End of semester review board	0
		16	16

Year 2

Fall	Hours	Spring	Hours
SMFA 6000	8	SMFA 6000	4
MFA thesis exhibition production	4	MFA thesis exhibition production	4
Northeastern nonstudio elective	4	Northeastern nonstudio elective course	4
End of semester review board	0	Thesis exhibition presentation	0
		End of semester review board	0
		16	12

Total Hours: 60

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 thirty 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

Students take three required courses and select one directed elective in consultation with faculty advisor.

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 ¹	3
Elective Course		
Complete one course from the following list:		3
AACE 6100	¹	
AACE 6200	Programming and Community Engagement for Cultural Entrepreneurs ¹	3
AACE 6300	¹	

¹ For course titles and curricula detail please see college administrator

Program Credit/GPA Requirements

12 total semester hours required

Minimum 3.000 GPA required

Game Design

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

Andrea Raynor, MFA
Interim Chair

Alessandro Canossa
Associate Professor and Graduate Coordinator
100 Meserve Hall
617.373.5242

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 MS 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 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. 51)

Graduate Certificate

- Game Analytics (p. 52)

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, games 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 Sciences (<http://www.ccs.neu.edu>), the **MS 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 6301	Introduction to Computational Statistics	

Concentration Options

The game science and design master's degree requires a concentration. Complete one of the following:

GAME ANALYTICS

Complete three courses from the following: 12

GSND 6350	Game Analytics	
DS 6020		
DS 6030		
PPUA 6302	Information Design and Visual Analytics	

GAME USER RESEARCH

Complete three courses from 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 courses from 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 concentrations.

Complete two courses from the following list: 8

CS 5150	Game Artificial Intelligence
CS 5340	Computer/Human Interaction
CS 5850	Building Game Engines
DS 6020	
DS 6030	
PPUA 6302	Information Design and Visual Analytics
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

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	Select two courses from one of the following concentrations:	8
GSND 5111	1	Game Analytics concentration	
GSND 5130 or PPUA 6301	4	Game User Research concentration	
		Game Design and Development concentration	
		GSND 5122	1
	9		9

Year 2

Fall	Hours	Spring	Hours
Select two courses from one of the following concentrations:	8	Select one course from one of the following concentrations:	4
Game Analytics concentration		Game Analytics concentration	
Game User Research concentration		Game User Research concentration	

Game Design & Development concentration	Game Design and Development concentration	
	GSND 6500	4
	8	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 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 help 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.

Degree Requirement

See the following page for program requirements.

Program Requirements

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

Requirements

Data Science Core

DS 6020	4
DS 6030	4

PPUA 6302	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 program at Northeastern University's School of Journalism. Our school offers a master of arts in two tracks—professional or media innovation. Our master's program offers a chance to study in Boston with a small and dedicated faculty of specialists with years of experience and extensive contacts in the media world.

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

The program typically takes three semesters: fall, spring, and fall. Students can also choose to take part in Northeastern's acclaimed cooperative education program. The co-ops can last either four or six months. Full-time students can complete the program in a year by enrolling in classes during the two summer semesters. It is also possible to enroll part-time. Students have up to seven years to fulfill the requirements of the program.

Programs

Master of Arts (MA)

- Journalism (p. 53)

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
JRNL 6966	Practicum	4

Electives

Complete 16 semester hours from the following areas: 16

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	3
JRNL 6307	Media Innovation Studio 2	3
JRNL 6308		3

Electives

Complete 20 semester hours from the following areas: 20

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

33 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

617.373.2440

617.373.4129 (fax)

Daniel Strong Godfrey, Graduate Coordinator, r.strasser@northeastern.edu

The Master of Science in Music Industry Leadership (MMIL) program is an intensive one-year leadership program designed for individuals who want to manage the next generation of music companies. The

MMIL 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. Students specialize in one of four curricula pathways: professional, research, entrepreneurship, and practice. 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 MMIL offers students four curriculum options for degree completion. A minimum of 32 semester hours and nine courses (not including the intensive reporting seminar), with a GPA of 3.000, are required for graduation. Each option is designed to highlight a student's strength and longer-term goals. Consultation with the graduate coordinator prior to degree commencement is required to establish a student's ideal curriculum pathway.

Programs

Master of Science (MS)

- Music Industry Leadership (p. 54)

Certificate

- NEC/NU Joint Certificate Program—General Certificate of Merit in Music Performance (p. 55)
- NEC/NU Joint Certificate Program—Professional Studies Certificate in Music Performance (p. 56)

Dual Degree (JD/MS)

- Music Industry Leadership (p. 58)

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.

Required Course Work

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

Options

Complete one of the following four options:

PROFESSIONAL OPTION

Business and Music Electives

Complete 17 semester hours from the following subject areas: 17

ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, and STRT

MUSI 6000 to MUSI 7976

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

ENTREPRENEURSHIP OPTION

Capstone Project

MUSI 7980 Capstone 4

Business and Music Electives

Complete 13 semester hours from the following subject areas: 13

ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, and STRT

MUSI 6000 to MUSI 7976

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

PRACTICE OPTION

Co-op Work Experience

MUSI 6964 Co-op Work Experience 0

Business and Music Electives

Complete 17 semester hours from the following subject areas: 17

ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, and STRT

MUSI 6000 to MUSI 7976

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

RESEARCH OPTION

Music Electives

Complete 9 semester hours from the following range of courses: 9

MUSI 6000 to MUSI 7976

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

Thesis

MUSI 7990 Thesis 8

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

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	Twentieth-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	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.

MPNC 1102	Music Instruction
MPNC 1103	Music Instruction
MPNC 1104	Music Instruction

Music Technology

MPNC 1201	Contemporary Music Production and Technology 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	Eighteenth-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	Twentieth-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	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.

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	Eighteenth-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 forty-five 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. 54)

Year Three

Summer—music industry courses (p. 54)

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

Websitead (<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 cohort program for working professionals who want to dive into innovation as it applies to products, services, operations, and processes. The program begins in September.

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)

- Business Analytics (p. 59)
- Innovation (p. 60)
- International Management (p. 60)
- Technological Entrepreneurship (p. 61)

Master of Science in Accounting (MSA)

- Accounting (p. 61)

Master of Science in Finance (MSF)

- Finance (p. 62)
- Finance—Evening/Part-Time Program (p. 62)
- Finance—Online Program (p. 62)

Master of Science in International Business (MSIB)

- International Business (p. 63)

Master of Science in Taxation (MST)

- Taxation (p. 63)
- Taxation—Online Program (p. 63)

Business Analytics, MS

The Master of Science in Business Analytics is a 31-semester-hour degree that is structured around four interdisciplinary core courses. After completion of the core, the student will be able to select from courses specific to the MS in Business Analytics.

Students may apply directly to the Master of Science in Business Analytics, or they may apply after successful completion of the data

science certificate. In both cases, students will complete the required interdisciplinary core courses before continuing study in business analytics.

Program Requirements

The Required Interdisciplinary Core

The four interdisciplinary core courses in data science/analytics serve as a foundation for the professional master's degree in business analytics.

The goal of the core is to provide foundational knowledge in data science/analytics that is applicable to any discipline. Students who complete the core can apply these principles to data-driven decision making in their own discipline.

The four required core courses (16 semester hours) were developed by an interdisciplinary committee comprised of active researchers who utilize big data. These faculty, many who have interdisciplinary appointments, are from the College of Computer and Information Science; the College of Social Sciences and the Humanities; the D'Amore McKim School of Business; and the College of Arts, Media and Design. The faculty reviewed content of existing master's programs to design the core. The four courses are:

Introduction to Computational Statistics	(pending approval)
Collecting, Storing, and Retrieving Data	(pending approval)
Data Mining and Machine Learning	(pending approval)
Information Design and Visual Analytics	(pending approval)

Following successful completion of the shared core courses, students in the business analytics program would take the following courses:

Introduction to Business Analytics	(pending approval)
New Media and Digital Marketing Analytics	(pending approval)
Advanced Enterprise Data Practice	(pending approval)
Business Analytics Strategic Capstone	(pending approval)
Business Analytics Elective	(pending approval)

Innovation, MS

The Master of Science in Innovation is a one-year, part-time program designed specifically for working professionals who want to become innovation leaders. The ten-course program covers the fundamentals of innovation in business from multiple perspectives by using case studies and experiential innovation projects. The cohort-based MS in Innovation starts in September and is held primarily on Saturdays.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

Fall Term

<i>Management</i>		
BUSN 6280	How Executives Shape and Lead Innovation and Enterprise Growth	3

Innovation

MGMT 6280	Innovation for Next-Generation Products and Systems	3
-----------	---	---

Marketing

MKTG 6280	Gaining Customer Insight	3
-----------	--------------------------	---

Spring Term

Accounting

ACCT 6280	Planning and Budgeting for Innovation	3
-----------	---------------------------------------	---

Marketing

MKTG 6283	Marketing and Selling Innovation	3
-----------	----------------------------------	---

Innovation

ENTR 6217	Lean Innovation	3
-----------	-----------------	---

Finance

FINA 6284	Financing Innovation and Growth	3
-----------	---------------------------------	---

Management

HRMG 6280	The Human Side of Innovation	3
-----------	------------------------------	---

Summer Term

Management

HRMG 6281	Leading and Implementing Innovation in Organizations	3
-----------	--	---

Innovation

MGSC 6281	Service Innovation and Management	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	

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	Professional Environment of the Audit and Assurance Industry	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 6255	Forensic Accounting	3
ACCT 6256	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 twelve-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 seventy 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

Program Credit/GPA Requirements

30 total semester hours required

Minimum cumulative 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 from 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 sixteen 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 from 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.

30 total semester hours required

Minimum 3.000 cumulative 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 6230	Federal Tax Issues and Analysis	3
ACCT 6231	Corporations and Shareholders	3
ACCT 6232	Estate and Gift Taxation	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 6230	Federal Tax Issues and Analysis	3
ACCT 6231	Corporations and Shareholders	3
ACCT 6232	Estate and Gift Taxation	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 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.

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 or as a combination of online and on-campus courses.

Programs

- MBA—Full-Time Program (p. 64)
- MBA—Evening/Part-Time Program (p. 66)
- MBA—Online Program (p. 69)

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

<i>Management</i>		
BUSN 6200	Career Management	0
BUSN 6950	MBA Skills Workshop	0
MGSC 6205	Management of Information Resources	2
<i>Financial Reporting</i>		
ACCT 6208	Financial Reporting and Managerial Decision Making	4
<i>Marketing</i>		
MKTG 6208	Marketing and Customer Value	4
<i>Economics</i>		

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:

ACCT, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, STRT, and TECE

Concentration Options

Complete one of the following concentrations:

- Entrepreneurship (p. 65)
- Healthcare management (p. 65)
- Finance—corporate or investment track (p. 65)
- Marketing (p. 65)
- Operations and supply chain management (p. 66)

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	
-----------	---	--

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**

HRMG 6220	Health Organization Management	3
-----------	--------------------------------	---

STRT 6220	Strategic Management for Healthcare Organizations	3
-----------	---	---

HINF 5101	Introduction to Health Informatics and Health Information Systems	3
-----------	---	---

HINF 6205	Creation and Application of Medical Knowledge	3
-----------	---	---

SCHM 6223	Managing Healthcare Supply Chain Operations	3
-----------	---	---

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	
-----------	-----------------------------	--

MKTG 6210	Marketing Research	
-----------	--------------------	--

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 6221	Entrepreneurial Finance	
-----------	-------------------------	--

FINA 6222	Risk Management and Insurance	
-----------	-------------------------------	--

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 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
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
MGSC 6206	Management of Service and Manufacturing Operations	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 15-18

Note: students may opt to take an additional concentration in lieu of elective coursework

Concentration Options

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

- Corporate finance (p. 66)
- Corporate renewal (p. 67)
- Entrepreneurship (p. 67)
- Healthcare management (p. 67)
- International business (p. 67)
- Investments (p. 67)
- Marketing (p. 67)
- Mutual fund management (p. 68)
- Supply chain management (p. 67)
- Technical entrepreneurship (p. 68)

Consult your college administrator for more information.

CONCENTRATION IN CORPORATE FINANCE

Required Course Work

FINA 6200	Value Creation through Financial Decision Making	3
-----------	--	---

FINA 6205	Financial Strategy	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 6210	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	

CONCENTRATION IN HEALTHCARE MANAGEMENT**Required Course Work**

HINF 5101	Introduction to Health Informatics and Health Information Systems	3
STRT 6220	Strategic Management for Healthcare Organizations	3
HRMG 6220	Health Organization Management	3

Restricted Elective

Complete one of the following:	3
--------------------------------	---

HINF 5101	Introduction to Health Informatics and Health Information Systems	
-----------	---	--

PHTH 5234	Economic Perspectives on Health Policy	
PHTH 5232	Evaluating Healthcare Quality	
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 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	

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	
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 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
--------------------------------	---

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	

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 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 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

FINA 6360 Fund Management for Analysts or FINA 6361 Fund Management for Managers	1
---	---

Electives**Marketing**

MKTG 6210 Marketing Research	3
MKTG 6212 International Marketing	3
MKTG 6214 New Product Development	3
MKTG 6216 Market Focused Strategy	3
MKTG 6218 Marketing in Service Sector	3
MKTG 6222 Digital Marketing	3
MKTG 6223 Brand and Advertising Management	3
MKTG 6224 B2B and Strategic Sales	3
MKTG 6226 Consumer Behavior	3

MKTG 6260 Special Topics in Marketing	3
---------------------------------------	---

Finance Group A

FINA 6203 Investment Analysis	3
FINA 6204 International Finance Management	3
FINA 6211 Financial Risk Management	3
FINA 6212 Fixed Income Securities and Risk	3
FINA 6213 Investment Banking	3
FINA 6217 Real Estate Finance and Investment	3
FINA 6218 Personal Financial Planning	3
FINA 6219 Portfolio Management	3
FINA 6222 Risk Management and Insurance	3

Finance Group B

FINA 6205 Financial Strategy	3
FINA 6204 International Finance Management	3
FINA 6213 Investment Banking	3
FINA 6214 Mergers and Acquisitions	3
FINA 6215 Business Turnarounds	3
FINA 6216 Valuation and Value Creation	3
FINA 6221 Entrepreneurial Finance	3
FINA 6222 Risk Management and Insurance	3
FINA 6260 Entrepreneurial Finance, Innovation Valuation, and Private Equity	3

Supply Chain Management

SCHM 6210 Supply Chain Management	3
SCHM 6211 Logistics and Transportation Management	3
SCHM 6212 Executive Roundtable in Supply Chain Management or SCHM 6222 Managing Emerging Issues in Supply Chain Management	3
SCHM 6213 Global Supply Chain Strategy	3
SCHM 6214 Sourcing and Procurement	3
SCHM 6215 Supply Chain Analytics	3
SCHM 6221 Sustainability and Supply Chain Management	3
SCHM 6223 Managing Healthcare Supply Chain Operations	3

Entrepreneurship

ENTR 6212 Business Planning for New Ventures	3
ENTR 6214 Social Enterprise	3
ENTR 6218 Business Model Design and Innovation	3
ENTR 6219 Financing Ventures from Early Stage to Exit	3
ENTR 6220 Family Business Leadership and Governance	3
ENTR 6222 Competing in Dynamic, Innovation-Driven Markets	3
ENTR 6223 Cross-Cultural Innovation Management	3
ENTR 6293 Design Thinking for Market-Driven Innovation	3
MGMT 6210 Law for Managers and Entrepreneurs	3
MKTG 6214 New Product Development	3
TECE 6300 Managing a Technology-Based Business	3

Technical Entrepreneurship

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
ENTR 6212	Business Planning for New Ventures	3
ENTR 6222	Competing in Dynamic, Innovation-Driven Markets	3
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity	3
Healthcare		
HINF 5105	The American Healthcare System	3
HRMG 6220	Health Organization Management	3
STRT 6220	Strategic Management for Healthcare Organizations	3
HINF 5101	Introduction to Health Informatics and Health Information Systems	3
PHTH 5232	Evaluating Healthcare Quality	3
PHTH 5234	Economic Perspectives on Health Policy	3
SCHM 6223	Managing Healthcare Supply Chain Operations	3
Mutual Fund Management		
FINA 6203	Investment Analysis	3
FINA 6219	Portfolio Management	3
FINA 6360	Fund Management for Analysts	1
FINA 6361	Fund Management for Managers	1
International Business		
INTB 6212	Cultural Aspects of International Business	3
FINA 6204	International Finance Management	3
INTB 6217	Creating Sustainable Competitive Advantage through Global Innovation	3
INTB 6226	Becoming a Global Leader	3
INTB 6230	International Field Study	3
MKTG 6212	International Marketing	3
SCHM 6213	Global Supply Chain Strategy	3
Corporate Renewal		
ENTR 6214	Social Enterprise	3
FINA 6215	Business Turnarounds	3
FINA 6216	Valuation and Value Creation	3
HRMG 6212	Creating an Innovative Organization	3
HRMG 6213	Leadership	3
HRMG 6218	Great Companies	3
MGMT 6214	Negotiations	2-3
MKTG 6214	New Product Development	3
MKTG 6216	Market Focused Strategy	3

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: 15

Note: Students may opt to take one or more concentration options in lieu of elective course work.

ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, MGSC, SCHM, STRT

Concentrations Options

- Finance (p. 70)
- Healthcare management (p. 70)
- High-technology management (p. 70)
- Innovation entrepreneurship (p. 70)
- International management (p. 70)
- Marketing (p. 70)
- Operations and supply chain management (p. 70)

- Sustainability (p. 70)

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

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
SCHM 6221	Sustainability and Supply Chain Management

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 6220	Growing and Protecting Business Value through the Supply Chain
SCHM 6221	Sustainability and Supply Chain Management

GPA Requirement

Semester Hours Completed	Minimum GPA Required
6–11	2.500
12–23	2.990
24 or more	3.000

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 MS in Accounting and an MBA—in just fifteen months. This program is designed for liberal arts, nonaccounting majors. The program includes a three-month, paid internship that may lead to full-time placement in public accounting upon completion.

The MS 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. 71)
- MSA/MBA—Professional Accounting Program (p. 71)
- MSF/MBA—Full-Time Program (p. 71)
- MSF/MBA—Evening/Part-Time Program (p. 72)
- MSF/MBA—Online Program (p. 73)
- JD/MBA (p. 74)

MS/MBA—Nursing and Business Administration

See Bouvé College of Health Sciences Nursing MS/MBA program (p. 233) 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		
MGSC 6206	Management of Service and Manufacturing Operations	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 credits vs.90 to earn the two degrees separately (MBA requires 60 credits, 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 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 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.

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

Our MS in Finance/MBA (MSF/MBA) program is designed to help you develop your managerial potential and your practical finance skills in key areas such as valuation, mergers and acquisitions, risk management, insurance, and investments.

In addition to taking all of the courses required in the D'Amore-McKim MBA program, you can also choose a career track (<http://www.damore-mckim.northeastern.edu/academic-programs/graduate-programs/dual-degrees/finance-mba/curriculum>) by focusing your finance electives in either investments or corporate finance. With a balance of theory and practical skills, you can position yourself for career advancement in an increasingly competitive environment. CFA® and CFP® materials are also integrated into the MSF/MBA program, helping you to prepare for your exam.

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
MGSC 6206	Management of Service and Manufacturing Operations	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

Note: Students may opt to take up to two concentrations in lieu of some elective course work (see the MBA-Evening Part-Time Program (p. 66) for concentration options)

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 MS 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

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
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

Marketing

MKTG 6200	Creating and Sustaining Customer Markets	3
MECN 6200	Global Competition and Market Dominance	3

Finance and Analysis

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

Entrepreneurship

ENTR 6200	Enterprise Growth and Innovation	3
-----------	----------------------------------	---

Seminar

FINA 6206	Finance Seminar	3
-----------	-----------------	---

Electives

Finance Electives

Complete 9 semester hours of finance electives. 9

Business Electives

Complete 6 semester hours from the following subject areas. Note that these courses may include finance courses: 6

MGSC, ENTR, FINA, HRMG, INTB, MECN, MKTG, MGMT, SCHM, STRT

GPA Requirement

Semester Hours Completed	Minimum GPA Required
6–11	2.500
12–23	2.990
24 or more	3.000

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. 74)
- Business Administration (p. 75)
- Business Administration—Online Program (p. 76)
- Corporate Finance (p. 77)
- Corporate Renewal (p. 77)
- Healthcare Administration and Policy (p. 77)
- Innovation Management (p. 78)
- International Business (p. 78)
- Investments (p. 78)
- Leadership and Human Capital (p. 79)
- Marketing (p. 79)
- Mutual Fund Management (p. 79)
- Supply Chain Management (p. 80)
- Supply Chain Management—Online Program (p. 80)
- Technological Entrepreneurship (p. 80)

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 credits
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.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Track Options

Below are some suggested tracks; however, a track is not required—students can design their own certificate by completing any courses from the MBA program (being mindful of prerequisites). *Note:* The part-time MBA track and the international student track require an additional 3 semester hours.

Part-Time MBA Track

This 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 prescribed courses listed below with a B or better in each and earn a minimum cumulative GPA of 3.300.

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

This track is an opportunity for international students to study full-time, earning 15 graduate credits over two consecutive semesters. Students must take the following five core MBA courses as they become available for this particular section and must be enrolled full-time in their first semester of study.

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

Additional Suggested Tracks

Accounting and Finance

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
FINA 6203	Investment Analysis	3
FINA 6219	Portfolio Management	3
MGSC 6200	Information Analysis	3

CPA Exam Prerequisites

FINA 6200	Value Creation through Financial Decision Making	3
MECN 6200	Global Competition and Market Dominance	3
MGMT 6210	Law for Managers and Entrepreneurs	3
MGSC 6204	Managing Information Resources	1.5

Innovation and Entrepreneurship

ENTR 6200	Enterprise Growth and Innovation	3
ENTR 6212	Business Planning for New Ventures	3
ENTR 6214	Social Enterprise	3
ENTR 6220	Family Business Leadership and Governance	3

International Business

INTB 6200	Managing the Global Enterprise	3
INTB 6212	Cultural Aspects of International Business	3
INTB 6224	Competing to Win in Emerging Markets	3
INTB 6226	Becoming a Global Leader	3
MECN 6200	Global Competition and Market Dominance	3

Healthcare

HINF 5101	Introduction to Health Informatics and Health Information Systems	3
HRMG 6220	Health Organization Management	3
PHTH 5232	Evaluating Healthcare Quality	3
SCHM 6223	Managing Healthcare Supply Chain Operations	3

Human Resources

HRMG 6200	Managing People and Organizations	3
HRMG 6212	Creating an Innovative Organization	3
HRMG 6213	Leadership	3
HRMG 6218	Great Companies	3
HRMG 6214	A Management Perspective of Human Resource Management	3

Marketing

MKTG 6200	Creating and Sustaining Customer Markets	3
MKTG 6222	Digital Marketing	3
MKTG 6223	Brand and Advertising Management	3
MKTG 6224	B2B and Strategic Sales	3
MKTG 6226	Consumer Behavior	3

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 academic advisor, you can tailor your own course of study within a specific discipline or across disciplines.

Program Requirements

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

Complete one of the options listed below.

A grade of B or higher is required in each course.

Management Option

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

Accounting and Finance Option

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

MGSC 6200	Information Analysis	3
Complete one course from the following:		3
FINA 6203	Investment Analysis	
FINA 6204	International Finance Management	
FINA 6205	Financial Strategy	
FINA 6211	Financial Risk Management	
FINA 6212	Fixed Income Securities and Risk	
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 6218	Personal Financial Planning	
FINA 6219	Portfolio Management	
FINA 6221	Entrepreneurial Finance	
FINA 6222	Risk Management and Insurance	
FINA 6260	Entrepreneurial Finance, Innovation Valuation, and Private Equity	

Innovation and Entrepreneurship Option

ENTR 6200	Enterprise Growth and Innovation	3
ENTR 6212	Business Planning for New Ventures	3
Complete two courses from the following:		6
ENTR 6210	Managing Operations in Early Stage Ventures	
ENTR 6214	Social Enterprise	
ENTR 6220	Family Business Leadership and Governance	
ENTR 6260	Advanced Topics in Entrepreneurship	

Marketing Option

MKTG 6200	Creating and Sustaining Customer Markets	3
Complete three courses from the following:		9
MKTG 6210	Marketing Research	
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	

Leadership and Change Option

HRMG 6200	Managing People and Organizations	3
Complete three courses from the following:		9
HRMG 6212	Creating an Innovative Organization	
HRMG 6213	Leadership	
HRMG 6218	Great Companies	
MGMT 6214	Negotiations	

International Business Option

INTB 6200	Managing the Global Enterprise	3
INTB 6212	Cultural Aspects of International Business	3
Complete two courses from the following:		6
FINA 6204	International Finance Management	
INTB 6224	Competing to Win in Emerging Markets	
INTB 6226	Becoming a Global Leader	

MECN 6200	Global Competition and Market Dominance
MKTG 6212	International Marketing

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 credits
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

FINA 6215	Business Turnarounds
FINA 6216	Valuation and Value Creation
FINA 6221	Entrepreneurial Finance
MKTG 6214	New Product Development
MKTG 6216	Market Focused Strategy
HRMG 6212	Creating an Innovative Organization
HRMG 6218	Great Companies
MGMT 6214	Negotiations
ENTR 6214	Social Enterprise

Program Credit/GPA Requirements

12 total semester hours required, may complete a maximum of 15 credits
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

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

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 6210	Supply Chain Management	3
SCHM 6211	Logistics and Transportation Management	3
SCHM 6213	Global Supply Chain Strategy	3

Elective

Complete 3 semester hours from the following: 3

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	

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.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements**Required Courses**

SCHM 6210	Supply Chain Management	3
-----------	-------------------------	---

SCHM 6211	Logistics and Transportation Management	3
SCHM 6213	Global Supply Chain Strategy	3

Elective

One of the following courses should be taken in the final semester: 3

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 MS 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

The College of Computer and Information Science (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, data 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 three 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 cyber attacks; and 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.

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 (p. 81)
- Academic Integrity (p. 81)
- Transfer of Credit (p. 81)

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. That being said, we require 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.

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

Our PhD in Computer Science program seeks to prepare students to conduct state-of-the-art computer science research in preparation for careers in government, industry, and academia. Similarly, our MS in Computer Science program offers students the opportunity to broadly expand their knowledge in the field while focusing on one of our curricular specialties:

- Artificial intelligence
- Computer science theory
- Database management
- Graphics and robotics
- Human/computer interaction
- Information security
- Networks
- Programming languages
- Software engineering
- Systems
- Game design

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

Admission Requirements

Applicants must submit an official application, official transcripts from all colleges/universities attended, a personal statement, official scores of the GRE General Test, and three letters of recommendation. International students must also submit official scores of the TOEFL examination. Acceptance into the College of Computer and Information Science is granted upon recommendation of the college graduate committee after a review of the completed application.

Candidates must have completed the undergraduate material listed below:

- Experience in some high-level procedural language, e.g., C, C++, Java, Scheme, ML
- Data structures
- Computer organization
- One year of college calculus

- Discrete mathematics

Industrial experience in these areas may be an acceptable substitute for formal course work. Students may be accepted provisionally while completing these deficiencies and may take graduate courses concurrently as their preparation allows.

Programs

Doctor of Philosophy (PhD)

- Computer Science (p. 82)
- Computer Science—Advanced Entry (p. 85)

Master of Science (MS)

- Data Science (p. 85)

Master of Science in Computer Science (MScS)

- Computer Science (p. 87)
- Computer Science—ALIGN Program (p. 88)

Graduate Certificate

- Computer Science (p. 89)

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 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 MS 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. 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.

Research/Survey Paper

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. Normally, the length of the paper should not exceed fifteen pages. 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.

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.

Comprehensive Examination

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 fifteen 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

Qualifying examination and area examination

Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

General Requirements

Programming

CS 7400	Intensive Principles of Programming Languages	4
---------	---	---

Systems

CS 7600	Intensive Computer Systems	4
---------	----------------------------	---

Algorithms

CS 7800	Advanced Algorithms	4
---------	---------------------	---

Computation

CS 7805	Theory of Computation	4
---------	-----------------------	---

Specialization Courses

Note: Please see specialization section below for full list of approved courses.		
Complete 8 semester hours from the following:		8
CS 5100 to CS 5850		
CS 6110 to CS 6810		

Open Electives

Note: Consult faculty advisor for the other acceptable courses.		
Complete 24 semester hours from the following:		24
CS 5100 to CS 5850		
CS 6110 to CS 6810		
CS 8982	Readings	

Dissertation

Upon achieving PhD candidacy, complete the following two (repeatable) courses for two consecutive semesters:

CS 9990	Dissertation	2-4
CS 8982	Readings	1-8
For remaining semester(s), please complete:		
CS 9996	Dissertation Continuation	0

Specializations

Complete 8 semester hours from the following:

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	Parallel Data Processing in MapReduce
CS 7270	Seminar in Database Systems
CS 7280	Special Topics in Database Management

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 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

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

Students must maintain a minimum GPA of 3.500 among the four core courses and two area electives as well as earn a grade of B or better in each of these courses.

Minimum overall 3.000 GPA required

**Plan of Study
Sample Curriculum****Year 1**

Fall	Hours	Spring	Hours
CS 7400	4	CS 7600	4
Elective (specialization)	4	Elective (specialization)	4

Year 2			
Fall	Hours	Spring	Hours
CS 7800	4	CS 7805	4
Elective	4	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.

Research/Survey Paper

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

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

Qualifying examination and area examination

Annual review

Dissertation proposal

Dissertation committee

Dissertation defense

General Requirements

Complete 16 semester hours of approved course work. Consult your faculty advisor for acceptable courses.

Dissertation

Upon achieving PhD candidacy, complete the following two (repeatable) courses for two consecutive semesters:

CS 9990	Dissertation	2-4
CS 8982	Readings	1-8

For remaining semester(s), please complete:

CS 9996	Dissertation Continuation	0
---------	---------------------------	---

Program Credit/GPA Requirements

16 total semester hours required

Students must maintain a minimum GPA of 3.500 as well as earn a grade of B or better in each course.

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 the College of Computer and Information Science, the College of Engineering, 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, the College of Engineering, and other partner colleges.

Course Requirements

The MS 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.

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.

- (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.
- (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	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 (ie Bouvé, CSSH courses) will register for an accompanying data science project course ((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.

Program Objectives

- 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

An average GPA of 3.000 or higher is required in 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 8 semester hours from one of the specialization areas lists below. 8

Complete 4 semester hours from the following: 4

CS 5100 to CS 5850

CS 6110 to CS 6810

CS 8674 Master's Project

CS 8982 Readings

Specializations

Complete 8 semester hours from the following:

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	Parallel Data Processing in MapReduce
CS 7270	Seminar in Database Systems
CS 7280	Special Topics in Database Management

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 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
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

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

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

CS 5500	Managing Software Development (a grade of B or higher is required)	4
or CS 5600	Computer Systems	

Algorithms

CS 5800	Algorithms (a grade of B or higher is required)	4
---------	---	---

Electives

Complete 8 semester hours from one of the specialization areas lists below. 8

Complete 4 semester hours from the following: 4

CS 5100 to CS 5850		
CS 6110 to CS 6810		
CS 8674	Master's Project	
CS 8982	Readings	

Specializations

Complete 8 semester hours from the following:

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	Parallel Data Processing in MapReduce
CS 7270	Seminar in Database Systems
CS 7280	Special Topics in Database Management

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 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

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

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

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. 90)

Master of Science (MS)

- Health Data Analytics (p. 92)
- Health Informatics (p. 93)
- Health Informatics—ALIGN Program (p. 94)

Graduate Certificate

- Health Informatics Management and Exchange (p. 253)
- Health Informatics Privacy and Security (p. 253)
- Health Informatics Software Engineering (p. 253)

Personal Health Informatics, PhD

Northeastern's PhD in Personal Health Informatics (PHI) is a new transdisciplinary doctoral program focused on educating top researchers

- 2 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 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 personal health informatics doctoral program 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 personal health informatics doctoral program 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 (2 semester hours). 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, 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 areas:	6-8
--	-----

(Note: Please see faculty advisor for other acceptable elective courses.)

HINF	
Dissertation	
Complete the following course twice:	8
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 MS 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 MS in Health Data Analytics consists of twelve 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

HINF 6400	Introduction to Health Data Analytics	3
DS 6020		4
DS 6030		4
PPUA 6301	Introduction to Computational Statistics	4
PPUA 6302	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
<i>Thesis</i>		
HINF XXXX	Health Data Analytics Thesis ¹	
<i>Capstone</i>		
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 under the Department of Health Sciences:

- 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	Epidemiology	

One course from the following may count toward the technical core requirement:

DS 6020		
DS 6030		
PPUA 6301	Introduction to Computational Statistics	
PPUA 6302	Information Design and Visual Analytics	

Elective Core

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	
DS 6020		
DS 6030		
PPUA 6301	Introduction to Computational Statistics	
PPUA 6302	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 web page (<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:		
HINF 0200	Health and Medicine for Nonclinicians	3
HINF 6230	Strategic Topics in Programming For Health Professionals	3

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	Epidemiology	

One course from the following may count toward the technical core requirement:

DS 6020		
DS 6030		
PPUA 6301	Introduction to Computational Statistics	
PPUA 6302	Information Design and Visual Analytics	

Elective Core

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	
DS 6020		
DS 6030		
PPUA 6301	Introduction to Computational Statistics	
PPUA 6302	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:

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 in Information Assurance and Cyber Security degree.

An industry-focused, interdisciplinary Master of Science in Information Assurance and Cyber Security combines knowledge of information security technology and cyber security tools with relevant knowledge from law, the social sciences, criminology, and management. The MS in Information Assurance and Cyber Security is designed for students focused on cyber security 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 cyber security 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 Cyber Security.

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. 95)
- Information Assurance—Advanced Entry (p. 96)

Master of Science in Information Assurance and Cyber Security (MSIA)

- Information Assurance and Cyber Security (p. 97)
- Information Assurance and Cyber Security—ALIGN Program (p. 98)

Information Assurance, PhD

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.

Students who choose the PhD in Information Assurance program have a strong desire to pursue academic research solving critical cyber security 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 Cyber Security (<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 cyber security have an opportunity to gain:

- A strong technical foundation in cyber security 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 cyber corps
 - 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 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

Course Requirements**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 Specialization Courses

Consult faculty advisor for other acceptable courses.

Complete 28 semester hours from the following: 28

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

Upon achieving PhD Candidacy, complete the following repeatable course two semesters:

IA 9990	Dissertation	4
---------	--------------	---

For the remaining semester(s) complete the following repeatable course:

IA 9996	Dissertation Continuation	0
---------	---------------------------	---

Program Credit/GPA Requirements

48 total semester hours required

Minimum 3.000 GPA required, 3.400 in core courses

Information Assurance, PhD—Advanced Entry

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.

Students who choose the PhD in Information Assurance program have a strong desire to pursue academic research solving critical cyber security 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 Cyber Security 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 cyber security have an opportunity to gain:

- A strong technical foundation in cyber security 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 cyber corps
 - 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	

Course Requirements

Complete 16 semester hours of approved course work. Consult your faculty advisor for acceptable courses.

Dissertation

Upon achieving PhD Candidacy, complete the following repeatable course for two semesters:

IA 9990	Dissertation	4
For remaining semester(s), complete the following repeatable course:		
IA 9996	Dissertation Continuation	0

Program Credit/GPA Requirements

16 total semester hours required
 Minimum 3.000 GPA required, 3.400 in core courses

Information Assurance and Cyber Security, MSIA

Our MS in Information Assurance and Cyber Security program combines an understanding of information technology with relevant knowledge from law, the social sciences, criminology, and management. This program is designed for working professionals and others who want knowledge they can apply in their workplaces to assess and manage information security risks effectively. The program provides a natural path to the PhD in Information Assurance program for students who want to pursue research in the field and careers involving research.

Admission Requirements

Admission to the Master of Science in Information Assurance and Cyber Security program requires:

- A bachelor's degree
- Knowledge of basic information technology concepts, and mathematics
- Experience or courses taken in introductory computer systems and discrete mathematics. If students do not have this preparation, their advisors will assign the necessary prerequisite courses.

ADDITIONAL REQUIREMENTS FOR INTERNATIONAL STUDENTS

International students must submit official scores on the TOEFL examination.

APPLICATION PROCESS

All applicants must submit:

- A completed application form
- Three confidential letters of recommendation

- The application fee
- Unofficial scanned copies of undergraduate/graduate transcripts to be uploaded to the online application (official transcripts from all colleges/universities attended indicating degree earned can be submitted at the time of admission)
- Official GRE score

The following items must accompany the application:

- A recent professional resumé listing detailed responsibilities in each position
- A written statement of purpose, career orientation, and expected outcomes and benefits from the program

Admission is granted upon the recommendation of the program's graduate committee after a review of complete application materials.

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 IA 5150. These courses cannot both be taken for credit.

Information Assurance and Cyber Security, MSIA—ALIGN Program

The innovative ALIGN bridge program to the interdisciplinary MS in Information Assurance and Cyber Security is designed for students with a BS/BA degree from all backgrounds. During the first semester of year 1, 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 MS in Information Assurance and Cyber Security 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

Discrete Structures

CS 1800	Discrete Structures	4
Cyberspace Technology		
IA 5001	Cyberspace Technology and Applications	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

39 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 IA 5150. These courses cannot both be taken for credit.

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. 51)

Graduate Certificate

- Data Analytics (p. 100)

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, games 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 Sciences (<http://www.ccs.neu.edu>), the **MS 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 or PPUA 6301	Usability and Empirical User Research Introduction to Computational Statistics	4

Concentration Options

The game science and design master's degree requires a concentration. Complete one of the following:

GAME ANALYTICS

Complete three courses from the following: 12

GSND 6350	Game Analytics	
DS 6020		
DS 6030		
PPUA 6302	Information Design and Visual Analytics	

GAME USER RESEARCH

Complete three courses from 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 courses from 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 concentrations.

Complete two courses from the following list: 8

CS 5150	Game Artificial Intelligence	
CS 5340	Computer/Human Interaction	
CS 5850	Building Game Engines	
DS 6020		
DS 6030		
PPUA 6302	Information Design and Visual Analytics	
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	

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 Select two courses from one of the following concentrations:	8
GSND 5111		1 Game Analytics concentration	
GSND 5130 or PPUA 6301		4 Game User Research concentration	
		Game Design and Development concentration	
		GSND 5122	1
			9
			9

Year 2

Fall	Hours	Spring	Hours
Select two courses from one of the following concentrations:		8 Select one course from one of the following concentrations:	4
Game Analytics concentration		Game Analytics concentration	
Game User Research concentration		Game User Research concentration	
Game Design & Development concentration		Game Design and Development concentration	
		GSND 6500	4
			8
			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 policy-making 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

DS 6020		4
DS 6030		4
PPUA 6301	Introduction to Computational Statistics	4
PPUA 6302	Information Design and Visual Analytics	4

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Website (<http://www.coe.neu.edu/academics/graduate-school-engineering>)

Nadine Aubry, PhD, Dean

Sara Wadia-Fascetti, PhD, Associate Dean for Graduate Education

130 Snell Engineering Center
617.373.2711

The Graduate School of Engineering (GSE) offers research and professional degree programs designed to prepare students for technical and leadership positions in industrial organizations, government laboratories, research laboratories, and educational institutions. We offer traditional day and part-time evening Master of Science and doctoral degree programs as well as a number of graduate certificate programs. GSE offers a significant number of courses and degree programs in an online or hybrid format that are well suited for distance learners.

Academic Policies and Procedures

- Learning Outcomes (p. 102)
- Admission Requirements (p. 102)
- Cooperative Education Policies (p. 102)
- Online and Video Streaming Examination Policy (p. 104)
- Course Registration and Withdrawal (p. 104)
- Academic Standards and Degree Requirements (p. 105)
- Administrative Procedures (p. 106)
- Petitions (p. 106)

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. 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 >	3.4
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, Civil, Industrial, Mechanical Engineering, and Operations Research

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 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 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).
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 the myNEU COOL 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.

International PhD Student Internships

An internship at Northeastern is a special, and rare, 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 (read: essential, vital, fundamental) 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 visa processing, 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 thirty 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.

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. 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.

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 holds a stipended graduate assistantship (SGA) is considered full-time 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.

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.

During graduation clearance, the Graduate School of Engineering will retroactively register students who fail to register for the correct sequence of 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. 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. 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*.

Repeating Courses

The Graduate School of Engineering allows students to repeat up to 8 semester hours of course work beyond stated minimum degree requirements in order to attain the required 3.000 GPA for graduation. In certain unusual circumstances students may petition to substitute one course for another course that they have already taken, as long as the subject matter of both courses is substantially similar. Substitution requests must be approved by the student's program/department, Graduate School of Engineering, and the Office of the Registrar.

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.

Students must obtain approval from their academic advisor and the Graduate School of Engineering prior to repeating a course.

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.

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

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 thirty business days from the day the student received written notification of dismissal. The graduate school will respond to the appeal within ten business days of the date of receipt.

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. 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

International Student and Scholar Institute 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 application must be submitted. The application fee is waived. In addition, the student must submit a completed Change of Degree Program form to the advisor of the desired 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 application must be submitted. The application fee is waived. In addition, the student must submit a completed Graduate School of Engineering Change of Degree Level form to the director of the PhD program to which he or she is applying. The form must then be forwarded to the Graduate School of Engineering for final review and processing (if admitted). 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 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

209 Lake Hall
617.373.3006
l.makowski@northeastern.edu

Jeffrey Ruberti, PhD
Professor and Graduate Director

211 Lake Hall
617-373-3984
j.ruberti@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 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Programs

Doctor of Philosophy (PhD)

- Bioengineering (p. 107)
- Bioengineering—Advanced Entry (p. 114)

Master of Science in Bioengineering (MSBioE)

- Bioengineering (p. 116)

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 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. 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 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	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 below 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

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 proposal)

Dissertation defense

General Requirements

Seminar

BIOE 7390	Seminar	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 7001	Biomaterials
-----------	--------------

CHME 5630	Biochemical Engineering
-----------	-------------------------

CHME 5699	Special Topics in Chemical Engineering
-----------	--

EECE 5664	Biomedical Signal Processing
-----------	------------------------------

ME 5667	Solid Mechanics of Cells and Tissues
---------	--------------------------------------

Dissertation Courses

BIOE 9990	Dissertation (taken twice)	0
-----------	----------------------------	---

Track Options

Complete one of the following tracks:

- Biomedical Imaging and Signal Processing Track (p.)
- Biomechanics and Mechanobiology Track (p. 110)
- BioMEMs/BioNANO Track (p. 110)
- Biochemical and Bioenvironmental Track (p. 111)
- Motor Control Track (p.)
- Biocomputing Track (p. 111)
- Cell and Tissue 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 5320	Advanced Biomedical Measurements and Instrumentation	
BIOE 5235	Biomedical Imaging	
BIOE 7100	Special Topics in Biomedical Imaging and Signal Processing	
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	
PHSC 6226	Imaging in Medicine and Drug Discovery	
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

CHME 5699	Special Topics in Chemical Engineering	4
ME 5665	Musculoskeletal Biomechanics	4
ME 7210	Elasticity and Plasticity	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 5410	Molecular Bioengineering	
BIOE 5380	Advanced Biomolecular Dynamics and Control	
BIOE 7300	Special Topics in Biomechanics	
BIOE 5630	Physiological Fluid Mechanics	
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 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
PHSC 5100	Concepts in Pharmaceutical Science
PHSC 6210	Drug Design, Evaluation, and Development
PHSC 6226	Imaging in Medicine and Drug Discovery
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 6226	Imaging in Medicine and Drug Discovery
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**

BIOL 6401	Research Methods and Critical Analysis in Molecular Cell Biology	4
CHME 5699	Special Topics in Chemical Engineering	4
CHME 7340	Chemical Engineering Kinetics	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 5410	Molecular Bioengineering
BIOE 5380	Advanced Biomolecular Dynamics and Control
BIOE 5420	Cellular Engineering
BIOE 5430	Principles and Applications of Tissue Engineering
BIOE 5630	Physiological Fluid Mechanics
BIOL 5307	Biological Electron Microscopy
BIOL 5577	
BIOL 5581	Biological Imaging
BIOE 7200	Special Topics in Cell and Tissue Engineering
CHME 7350	Transport Phenomena
EECE 5648	Biomedical Optics
ME 5667	Solid Mechanics of Cells and Tissues
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 5380	Advanced Biomolecular Dynamics and Control
BIOE 5420	Cellular Engineering
BIOE 5430	Principles and Applications of Tissue Engineering
BIOL 5307	Biological Electron Microscopy
BIOE 5250	Design, Manufacture, and Evaluation of Medical Devices
BIOE 5630	Physiological Fluid Mechanics
BIOE 7100	Special Topics in Biomedical Imaging and Signal Processing
BIOE 7300	Special Topics in Biomechanics
BIOL 5553	Biology of Muscle: Molecules to Movements
BIOL 5577	
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	EECE 7213	System Identification and Adaptive Control
BINF 6308	Bioinformatics Computational Methods 1	EECE 7214	Optimal and Robust Control
BINF 6309	Bioinformatics Computational Methods 2	EECE 7236	Special Topics in Control
BINF 6200	Bioinformatics Programming	EECE 7271	Computational Methods in Electromagnetics
CAEP 6202	Research, Evaluation, and Data Analysis	EECE 7280	Fourier and Binary Optics
CHEM 5612	Principles of Mass Spectrometry	EECE 7281	Fourier Optics
CHEM 5613	Optical Methods of Analysis	EECE 7284	Optical Properties of Matter
CHEM 5620	Protein Chemistry	EECE 7293	Modern Imaging
CHEM 5621	Principles of Chemical Biology for Chemists	EECE 7310	Modern Signal Processing
CHEM 5637	Foundations of Spectroscopy	EECE 7311	Two Dimensional Signal and Image Processing
CHEM 5638	Molecular Modeling	EECE 7312	Statistical and Adaptive Signal Processing
CHEM 5660	Analytical Biochemistry	EECE 7313	Pattern Recognition
CHEM 5686	Fundamentals of Molecular Structure and Electronics	EECE 7314	Auditory Signal Processing
CHEM 7247	Advances in Nanomaterials	EECE 7323	Numerical Optimization Methods
CHEM 7317	Analytical Biotechnology	EECE 7335	Detection and Estimation Theory
CHME 5630	Biochemical Engineering	EECE 7337	Information Theory
CHME 5699	Special Topics in Chemical Engineering	EECE 7339	Testing and Design for Testability
CHME 7260	Special Topics in Chemical Engineering	EECE 7350	Software Engineering 1
CHME 7330	Chemical Engineering Thermodynamics	EECE 7351	Software Engineering 2
CHME 7340	Chemical Engineering Kinetics	EECE 7352	Computer Architecture
CHME 7350	Transport Phenomena	EECE 7353	VLSI Design
CIVE 7251	Environmental Biological Processes	EECE 7354	VLSI Architecture
CS 5100	Foundations of Artificial Intelligence	EECE 7357	Fault-Tolerant Computers
CS 5200	Database Management Systems	EECE 7358	Parallel Architecture for High-Performance Computing
CS 5310	Computer Graphics	EECE 7359	Multiprocessor Architectures
CS 5320	Digital Image Processing	EECE 7360	Combinatorial Optimization
CS 5330	Pattern Recognition and Computer Vision	EECE 7361	Digital Hardware Synthesis
CS 5335	Robotic Science and Systems	EECE 7364	Mobile and Wireless Networking
CS 5336	Lab for CS 5335	EECE 7365	Distributed Systems
CS 5600	Computer Systems	EECE 7367	Robotics and Automation Systems
CS 5800	Algorithms	EECE 7368	High-Level Design of Hardware-Software Systems
CS 6110	Knowledge-Based Systems	EECE 7389	Robot Vision and Sensors
CS 6140	Machine Learning	EXSC 6263	Research Design and Methodology
CS 6200	Information Retrieval	IE 7280	Statistical Methods in Engineering
CS 6410	Compilers	IE 7315	Human Factors Engineering
CS 6610	Parallel Computing	ME 5650	Advanced Mechanics of Materials
CS 6810	Distributed Algorithms	ME 5655	Dynamics and Mechanical Vibration
EECE 5606	Micro- and Nanofabrication	ME 5657	Finite Element Method
EECE 5648	Biomedical Optics	ME 5659	Control Systems Engineering
EECE 7200	Linear Systems Analysis	ME 5665	Musculoskeletal Biomechanics
EECE 7202	Electromagnetic Theory 1	ME 5667	Solid Mechanics of Cells and Tissues
EECE 7203	Complex Variable Theory and Differential Equations	ME 6200	Mathematical Methods for Mechanical Engineers 1
EECE 7204	Applied Probability and Stochastic Processes	ME 6201	Mathematical Methods for Mechanical Engineers 2
EECE 7205	Fundamentals of Computer Engineering	ME 6260	Introduction to Microelectromechanical Systems (MEMS)
EECE 7211	Nonlinear Control	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
PHSC 5100	Concepts in Pharmaceutical Science
PHSC 6210	Drug Design, Evaluation, and Development
PHSC 6218	Biomedical Chemical Analysis
PHSC 6226	Imaging in Medicine and Drug Discovery
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. 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 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:** 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) 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 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	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

Qualifying examination and area examination

Annual review

Dissertation proposal

Dissertation committee

Dissertation defense

GENERAL REQUIREMENTS

Seminar

BIOE 7390	Seminar	0
-----------	---------	---

Approved Course Work

Select courses in consultation with faculty advisor.	16
--	----

Dissertation Courses

BIOE 9990	Dissertation (taken twice)	0
-----------	----------------------------	---

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 (BIOE 7990, Master's Thesis, 8 semester hours of research)
- MS project option (BIOE 7890, Master's Project, 4 semester hours of research)
- Course-only option
- Graduate certificate option

Students are required to complete a total of 33 semester hours of courses with a minimum cumulative GPA of 3.000 to graduate with an MS in Bioengineering. All MS students are required to take two core courses (BIOE 5100, Medical Physiology, and BIOE 6000, Principles of Bioengineering). 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 BIOE 7390, Seminar, 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 (EECE 7200, Linear Systems Analysis, and EECE 7204, Applied Probability and Stochastic Processes) 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 (BIOE 5410, Molecular Bioengineering, and BIOE 5380, Advanced Biomolecular Dynamics and Control) 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 ME 5665, Musculoskeletal Biomechanics, and ME 5650, Advanced Mechanics of Materials.

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, BIOE 5810, Design of Biomedical Instrumentation, and BIOE 5250, Design, Manufacture, and Evaluation of Medical Devices, are required for all students in this concentration.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

**GORDON INSTITUTE OF ENGINEERING LEADERSHIP
Master's Degree in Bioengineering with Graduate Certificate in Engineering Leadership**

Students may complete a master's degree 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 16 hours of advisor-approved Bioengineering technical courses.

Engineering Leadership (p. 163)

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. 117)
- Cell and Tissue Engineering (p. 118)
- Biomechanics (p. 118)
- Biomedical Devices (p. 118)

BIOIMAGING AND SIGNAL PROCESSING

Required Course Work

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

BIOE 7990	Thesis (4SH, take twice)	8
-----------	--------------------------	---

Electives

Complete 12 semester hours from the course list.	12
--	----

Certificate Option

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate required course work. (p. 162)	16
---	----

Complete 4 semester hours from the course list:	4
---	---

Course List

BIOE 5320	Advanced Biomedical Measurements and Instrumentation	4
BIOE 5235	Biomedical Imaging	4
BIOE 7100	Special Topics in Biomedical Imaging and Signal Processing	4
BIOL 5581	Biological Imaging	4
EECE 5639	Computer Vision	4
EECE 5648	Biomedical Optics	4
EECE 7203	Complex Variable Theory and Differential Equations	4

EECE 7204	Applied Probability and Stochastic Processes	4
EECE 7314	Auditory Signal Processing	4

CELL AND TISSUE ENGINEERING**Required Course Work**

BIOE 5410	Molecular Bioengineering	4
BIOE 5380	Advanced Biomolecular Dynamics and Control	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

BIOE 7990	Thesis (4SH, take twice)	8
-----------	--------------------------	---

Electives

Complete 12 semester hours from the course list. 12

Certificate Option

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate required course work. (p. 162) 16

Complete 4 semester hours from the course list: 4

Course List

BIOE 5420	Cellular Engineering	4
BIOE 5430	Principles and Applications of Tissue Engineering	4
BIOE 5820	Biomaterials	4
BIOL 5543	Stem Cells and Regeneration	4
BIOL 6301	Molecular Cell Biology	4
CHEM 5500	Introduction to Regulatory Science	2
ME 5667	Solid Mechanics of Cells and Tissues	4
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market	3
NNMD 5370	Nanomedicine Research Techniques	4

BIOMECHANICS**Required Course Work**

ME 5650	Advanced Mechanics of Materials	4
ME 5665	Musculoskeletal 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

BIOE 7990	Thesis (4SH, take twice)	8
-----------	--------------------------	---

Electives

Complete 12 semester hours from the course list. 12

Certificate Option

Complete 16 semester hours of graduate certificate required course work. (p. 162) 16

Complete 4 semester hours from the course list: 4

Course List

BIOE 5630	Physiological Fluid Mechanics	4
BIOE 7001	Biomaterials	4
BIOE 7300	Special Topics in Biomechanics	4
BIOL 5553	Biology of Muscle: Molecules to Movements	4
BIOL 5601	Multidisciplinary Approaches in Motor Control	4
BIOL 7384	Topics in Integrative Biology	2
EECE 7200	Linear Systems Analysis	4
EECE 7203	Complex Variable Theory and Differential Equations	4
EECE 7367	Robotics and Automation Systems	4
ME 5650	Advanced Mechanics of Materials	4
ME 5655	Dynamics and Mechanical Vibration	4
ME 5657	Finite Element Method	4
ME 5659	Control Systems Engineering	4
ME 5667	Solid Mechanics of Cells and Tissues	4
ME 7210	Elasticity and Plasticity	4
ME 7238	Advanced Finite Element Method	4
ME 7240	Composite Materials	4
ME 7245	Fracture Mechanics and Failure Analysis	4
ME 7255	Continuum Mechanics	4

BIOMEDICAL DEVICES**Required Course Work**

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

BIOE 7990	Thesis (4SH, take twice)	8
-----------	--------------------------	---

Electives

Complete 12 semester hours from the course list. 12

Certificate Option

Complete 16 semester hours of graduate certificate required course work. (p. 162) 16

Complete 4 semester hours from the course list: 4

Course List

BIOE 5850	Design of Implants	4
BIOE 7001	Biomaterials	4
BIOE 7400	Special Topics in Biomedical Devices	4
CHEM 5500	Introduction to Regulatory Science	2
EECE 5606	Micro- and Nanofabrication	4
ME 5659	Control Systems Engineering	4
ME 5665	Musculoskeletal Biomechanics	4

ME 5667	Solid Mechanics of Cells and Tissues	4
ME 7262	Nanomanufacturing 1	4
NNMD 5470	Nano- and Biomedical Commercialization: From Concept to Market	3
NNMD 5370	Nanomedicine Research Techniques	4

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

Ronald J. Willey, PhD

Professor and Vice Chair

313 Snell Engineering Center

617.373.2989

617.373.2209 (fax)

Thomas J. Webster, PhD, Professor and Chair,

th.webster@northeastern.edu

The department offers a Master of Science and a Doctor of Philosophy in Chemical Engineering. The MS degree is offered as either a thesis or a nonthesis degree. Most courses are offered in the late afternoon or early evening to make them accessible to part-time students pursuing full-time industrial careers. A full-time MS student may apply for participation in the cooperative education plan. Master's students pursuing the thesis option must first gain the consent of their advisor prior to participating in the cooperative education plan. The MS thesis 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 are able to select thesis topics from a diverse range of faculty research interests. New graduate students can learn about ongoing research topics 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 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Programs

Doctor of Philosophy (PhD)

- Chemical Engineering (p. 119)
- Chemical Engineering—Advanced Entry (p. 120)

Master of Science in Chemical Engineering (MSCHE)

- Chemical Engineering (p. 122)

Graduate Certificate

- Process Safety Engineering (p. 123)

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 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 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 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 below) 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 0-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 chemical engineering department. After

the first semester, students will work with their 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 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's web page (<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

Requires the following four courses with a GPA of 3.500 or higher:

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	0
-----------	---------	---

Electives

Requires 8 semester hours. Consult your faculty advisor for acceptable courses. 8

Dissertation

Must be taken twice:

CHME 9990	Dissertation	0
-----------	--------------	---

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 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 chemical engineering department. 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

Requires the following four courses with a GPA of 3.500 or higher:

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	0
-----------	---------	---

Electives

Requires 8 semester hours. Consult your faculty advisor for acceptable courses.

Dissertation

Must be taken twice:

CHME 9990	Dissertation	0
-----------	--------------	---

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. 106) 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. Full-time Master of Science degree students who complete the required 8 semester hours of thesis work (Thesis (CHME 7990)) are required to register for Thesis Continuation (CHME 7996) each semester until their thesis is completed. Note that although no credits are associated with Thesis Continuation (CHME 7996), a student registered for this course is considered full-time.

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. 123).

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 left 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.

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 required²	32 SH	32 SH

¹ Students may complete a maximum of 8 semester hours (thesis option) or 12 semester hours (nonthesis option) of course work for credit outside the Department of Chemical Engineering under guidance of their advisor and approval of the chemical engineering graduate program director.

² Exclusive of any preparatory undergraduate courses.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)

- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Chemical Engineering with Graduate Certificate in Engineering Leadership

Students may complete a master's degree 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. 163)

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. 16
(p. 123)

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. 8
(p. 123)

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate required course work. (p. 162) 16

Course List

CHME 5204	Heterogeneous Catalysis	4
CHME 5630	Biochemical Engineering	4
CHME 7201	Fluid Mechanics	4
CHME 7202	Chemical Process Heat Transfer	4
CHME 7205	Numerical Techniques in Chemical Engineering	4
CHME 7210	Advanced Chemical Engineering Calculations	4
CHME 7220	Electronic Materials, Thin Films, and Nanostructures	4
CHME 7221	Thin Film Technology	4
CHME 7222	Principals of Membrane Processes	4
CHME 7231	Chemical Process Dynamics and Control	4
CHME 7240	Polymer Science	4
CHME 7260	Special Topics in Chemical Engineering	4
CHME 7261	Special Topics in Chemical Engineering	2
CHME 7978	Independent Study	1-4
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage	4
ENGR 6150	Nanotechnology in Engineering	4

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 6620		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

The Department of Civil and Environmental Engineering (CEE) offers graduate programs leading to the degrees of Master of Science in Civil Engineering, Master of Science (without specification), and Doctor of Philosophy in Civil Engineering. At the master's level, five areas of concentration are offered:

- Construction management
- Environmental and water systems engineering
- Geotechnical/geoenvironmental engineering
- Structural engineering
- Transportation engineering

Students may pursue the Master of Science degree program on either a full- or part-time basis. Students must pursue the PhD program on a basis consistent with the residence requirements for the degree as described in the curriculum requirements. The curriculum includes areas of concentration in construction management, environmental engineering, geotechnical/geoenvironmental engineering, structural engineering, and transportation engineering. 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 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 as another elective may also be considered as other electives, but these courses require a petition approved by the concentration advisor via the Graduate School of Engineering petition system. Links to the individual concentrations may be found under the Programs tab.

Graduate Certificate Options

Students enrolled in a master's degree in Civil Engineering have the opportunity to also pursue one of 14 engineering graduate certificate

options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Programs

Doctor of Philosophy (PhD)

- Civil Engineering (p. 124)
- Civil Engineering—Advanced Entry (p. 125)

Master of Science (MS)

- Engineering and Public Policy with Concentration in Energy and Environment (p. 133)
- Engineering and Public Policy with Concentration in Infrastructure Resilience (p. 134)

Master of Science in Civil Engineering (MSCivE)

- Civil Engineering with Concentration in Construction Management (p. 126)
- Civil Engineering with Concentration in Environmental and Water Systems (p. 128)
- Civil Engineering with Concentration in Geotechnical/Geoenvironmental Engineering (p. 129)
- Civil Engineering with Concentration in Structural Engineering (p. 130)
- Civil Engineering with Concentration in Transportation Engineering (p. 132)

Master of Science in Environmental Engineering (MSENVE)

- Environmental Engineering (p. 136)

Civil Engineering, PhD

Award 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 an expanded group of faculty and research staff upon completion of the work.

The doctoral program is deliberately 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.

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 eighteen months of their PhD program. PhD students who start their graduate program at Northeastern with a BS degree shall take the qualifying exam within the first thirty months after entering the program. Upon successful completion of the exam, the student is classified as a doctoral candidate.

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 dissertation committee formed by the student and his or her dissertation advisor will monitor progress and approve the final document. The 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 doctoral candidate must defend his or her dissertation within seven years from the start of the PhD program.

Course Requirements

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 qualifying exam 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.

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.

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.

Comprehensive Examination

The comprehensive exam is a defense of the doctoral research work and an examination on subject matter related to the dissertation area.

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 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

CIVE 9990	Dissertation (repeat twice)	0
-----------	-----------------------------	---

Program Credit/GPA Requirements

52 total semester hours required
 Minimum 3.000 GPA required

Civil Engineering, PhD—Advanced Entry

Award 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 an expanded group of faculty and research staff upon completion of the work.

The doctoral program is deliberately 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.

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 eighteen months of their PhD program. Upon successful completion of the exam, the student is classified as a doctoral candidate.

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 dissertation committee formed by the student and his or her dissertation advisor will monitor progress and approve the final document. The 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 doctoral candidate must defend his or her dissertation within seven years from the start of the PhD program.

Course Requirements

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 qualifying exam 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.

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.

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.

Residence Requirement

After achieving PhD candidacy, students must complete at least two successive semesters of full-time study on campus to establish residence. 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.

Comprehensive Examination

The comprehensive exam is a defense of the doctoral research work and an examination on subject matter related to the dissertation area.

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

CIVE 9990	Dissertation (repeat twice)	0
-----------	-----------------------------	---

PROGRAM CREDIT/GPA REQUIREMENTS

20 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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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 34 semester hour degree and certificate

will require 16 hours of advisor-approved Construction Management technical courses.

Engineering Leadership (p. 163)

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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Course List

OR 6205	Deterministic Operations Research	4
ACCT 6200	Financial Reporting and Managerial Decision Making 1	3
ACCT 6201	Financial Reporting and Managerial Decision Making 2	1.5
CIVE 5231	Alternative Project Delivery Systems in Construction	2
CIVE 7240	Construction Equipment and Modeling	4
CIVE 7301	Advanced Soil Mechanics	4
CIVE 7302	Advanced Foundation Engineering	4
EMGT 5300	Engineering/Organizational Psychology	4
IE 7215	Simulation Analysis	4
IE 7290	Reliability Analysis and Risk Assessment	4
IE 7615	Neural Networks in Engineering	4
INFO 6210	Data Management and Database Design	4
INFO 6215	Business Analysis and Information Engineering	4

INFO 6245	Planning and Managing Information Systems Development	4
-----------	---	---

PROGRAM CREDIT/GPA REQUIREMENTS

32 total semester hours required (except for the Certificate Option that requires a total of 34 semester hours)

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 water 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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)

- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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. 163)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

Complete two of the following: 8

CIVE 7100	Applied Time Series and Spatial Statistics	
CIVE 7260	Hydrologic Modeling	
CIVE 7261	Surface Water Quality Modeling	
CIVE 7263	Groundwater Quality Modeling	
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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Required Course Work

Complete 16 semester hours of graduate certificate course work (p. 162) 16

Restricted Elective

Complete 8 semester hours from the Restricted Elective List below. 8

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	4
CIVE 5270	Environmental Protection and Management	4
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	4
CIVE 5280		
CIVE 5290		
CIVE 5321	Geoenvironmental Engineering	4
CIVE 5536	Hydrologic Engineering	4
CIVE 7110	Critical Infrastructure Resilience	4
CIVE 7250	Environmental Chemistry	4
CIVE 7251	Environmental Biological Processes	4
CIVE 7252	Water Engineering, Resources, and Energy Recovery	4
CIVE 7255	Environmental Physical/Chemical Processes	4
CIVE 7382	Advanced Traffic Control and Simulation	4
CIVE 7392	Special Topics in Environmental Engineering (Agent Based Modeling)	4

OTHER ELECTIVE LIST

Any required core course not used to meet the required core course or restricted elective requirements can be taken as an other elective.

Any restricted elective not used to meet the restricted elective requirement can be taken as another elective.

CIVE 5271	Solid and Hazardous Waste Management	4
CIVE 7272	Air Quality Management	4
EECE 5626	Image Processing and Pattern Recognition	4
EECE 7204	Applied Probability and Stochastic Processes	4
ENVR 5260	Geographical Information Systems	4
EEMB 5516	Oceanography	4
IE 6200	Engineering Probability and Statistics	4
IE 7280	Statistical Methods in Engineering	4
IE 7290	Reliability Analysis and Risk Assessment	4

MATH 7341	Probability 2	4
MATH 7343	Applied Statistics	4
MATH 7344	Regression, ANOVA, and Design	4

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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)

- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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’s degree 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. 163)

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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master’s degree. Students should consult their faculty advisor regarding the certificate options.

Required Course Work

Complete 16 semester hours of graduate certificate course work. (p. 162)	16
--	----

Electives

Complete 8 semester hours from the Elective Course List below.	8
--	---

Elective Course List

CIVE 5270	Environmental Protection and Management	4
CIVE 5271	Solid and Hazardous Waste Management	4
CIVE 5321	Geoenvironmental Engineering	4
CIVE 5536	Hydrologic Engineering	4
CIVE 7230	Legal Aspects of Civil Engineering	4
CIVE 7240	Construction Equipment and Modeling	4
CIVE 7250	Environmental Chemistry	4
CIVE 7251	Environmental Biological Processes	4
CIVE 7260	Hydrologic Modeling	4
CIVE 7263	Groundwater Quality Modeling	4
CIVE 7311	Soil and Foundation Dynamics	4
CIVE 7312	Earthquake Engineering	4
CIVE 7330	Advanced Structural Analysis	4
CIVE 7331	Structural Dynamics	4
IE 6200	Engineering Probability and Statistics	4
IE 7290	Reliability Analysis and Risk Assessment	4
ME 5657	Finite Element Method	4
ME 7205	Advanced Mathematical Methods for Mechanical Engineers	4

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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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. 163)

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	

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Required Course Work

Complete 16 semester hours of graduate certificate course work. (p. 162)	16
--	----

Restricted Electives

Complete 8 hours from the Restricted Elective List below.	8
---	---

Course Lists

RESTRICTED ELECTIVE LIST

CIVE 5522	Structural Analysis 2	4
CIVE 7340	Seismic Analysis and Design	4
CIVE 7341	Structural Reliability	4
CIVE 7342	System Identification	4
CIVE 7350	Behavior of Concrete Structures	4
CIVE 7351	Behavior of Steel Structures	4
CIVE 7354	Wind Engineering	4
CIVE 7355	Advanced Bridge Design	4

OTHER ELECTIVE LIST

Any restricted elective not used to meet the restricted elective requirement can be taken as another elective.

MATH 7241	Probability 1	4
MATH 7342	Mathematical Statistics	4
MATH 7343	Applied Statistics	4
MATL 7365	Properties and Processing of Electronic Materials	4
ME 5240	Computer Aided Design and Manufacturing	4
ME 5650	Advanced Mechanics of Materials	4
ME 5655	Dynamics and Mechanical Vibration	4
ME 5657	Finite Element Method	4
ME 5659	Control Systems Engineering	4

ME 6200	Mathematical Methods for Mechanical Engineers 1	4
ME 6201	Mathematical Methods for Mechanical Engineers 2	4
ME 7205	Advanced Mathematical Methods for Mechanical Engineers	4
ME 7210	Elasticity and Plasticity	4
ME 7232	Theory of Plates and Shells	4
ME 7238	Advanced Finite Element Method	4
ME 7245	Fracture Mechanics and Failure Analysis	4
ME 7255	Continuum Mechanics	4

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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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. 163)

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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Project

Complete 16 semester hours of graduate certificate course work. (p. 162)	16
--	----

Restricted Elective

Complete 4 semester hours from the Restricted Elective list below.	4
--	---

Restricted Elective List

CIVE 7380	Transportation Performance and Simulation Models	4
CIVE 7381	Transportation Demand Models	4
CIVE 7385	Public Transportation	4
CIVE 7387	Design Aspects of Roadway Safety	4
IE 7215	Simulation Analysis	4
IE 7280	Statistical Methods in Engineering	4

Other Elective List

Any restricted elective not used to meet the restricted elective requirement can be used as another elective.

EECE 7313	Pattern Recognition	4
IE 7275	Data Mining in Engineering	4
IE 7290	Reliability Analysis and Risk Assessment	4
OR 6205	Deterministic Operations Research	4
OR 7230	Probabilistic Operation Research	4
OR 7245	Network Analysis and Advanced Optimization	4
INFO 6210	Data Management and Database Design	4
DS 6030		4
MATH 7347	Statistical Decision Theory	4
MATH 7343	Applied Statistics	4
PPUA 5263	Geographic Information Systems for Urban and Regional Policy	3
PPUA 7231	Transportation Policy	3
PPUA 7234	Land Use and Urban Growth Policy	3

Other adviser approved elective

Program Credit/GPA Requirements

32 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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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 16 hours of advisor-approved Energy and Environment technical courses.

Engineering Leadership (p. 163)

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 Policy Making	

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
-----------	--------	---

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

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	
CIVE 5699	Special Topics in Civil Engineering (Water Quality Analysis)
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)
ENVR 5210	Environmental Planning
ME 5645	Environmental Issues in Manufacturing and Product Use
IE 5500	Systems Engineering in Public Programs
IE 5640	Data Mining for Engineering Applications
EMGT 6225	Economic Decision Making
ENVR 5260	Geographical Information Systems
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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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 16 hours of advisor-approved Infrastructure Resilience technical courses.

Engineering Leadership (p. 163)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

Infrastructure Resilience		4
CIVE 7110	Critical Infrastructure Resilience	
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 Policy Making	
CIVE 5280		
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
-----------	--------	---

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

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

Environmental Engineering, MSENVE

This program includes study in water and wastewater treatment and disposal, hazardous waste management, surface water and groundwater quality, and water resources management. 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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP**Master's Degree in Environmental Engineering with Graduate Certificate in Engineering Leadership**

Students may complete a master's degree 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 16 hours of advisor-approved Environmental Engineering technical courses.

Engineering Leadership (p. 163)

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	12
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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Required Course Work

Complete 16 semester hours of graduate certificate course work (p. 162) 16

Restricted Elective

Complete 8 semester hours from the restricted electives list below. 8

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 5270	Environmental Protection and Management
CIVE 5271	Solid and Hazardous Waste Management

CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure
CIVE 5321	Geoenvironmental Engineering
CIVE 5536	Hydrologic Engineering
CIVE 5699	Special Topics in Civil Engineering (Water Quality Analysis)
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 5210	Environmental Planning
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

Computer Systems Engineering

Website (<http://www.coe.neu.edu/degrees/ms-cse>)

Kal Bugrara, PhD

Program Director

130 Snell Engineering

617.373.4448

617.373.2501 (fax)

Kal Bugrara, PhD, Program Director, kmb@coe.neu.edu

Our newly renovated 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.

Graduate Certificate Options

Students enrolled in a master’s degree in Computer Systems Engineering have the opportunity to also pursue one of 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) 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. 138)

Graduate Certificate

- Computer Systems Engineering (p. 139)

Computer Systems Engineering with Concentration in Software Design Engineering, MSCSE

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 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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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’s degree 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. 163)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Complete the following:

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 from the following subject areas: 24

INFO (INFO 6250 excluded), CSYE

THESIS OPTION

CSYE 7990 Thesis 8

Complete 16 semester hours from the following subject areas: 16

INFO (except INFO 6250), CSYE

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Required Course Work

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Elective

Complete 8 semester hours from the following subject areas: 8

INFO (except INFO 6250), CSYE

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

Computer Systems Engineering, Graduate Certificate

The computer systems engineering graduate certificate program focuses on the sociotechnical approach to software engineering with attention on using engineering tools and considering real-world complexities to design and construct practical and viable software solutions.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of engineering knowledge and skills to software development with attention on enterprise design and integration, secure systems design and creation, and data integration and architecture.

Note: MS in Computer Systems Engineering students are not eligible for this graduate certificate.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses

CSYE 6205	Concepts of Object-Oriented Design with C++	4
CSYE 6220	Enterprise Software Design	4
CSYE 7230	Software Engineering	4

Elective

Complete one of the following: 4

CSYE 7215 Foundations of Parallel, Concurrent, and Multithreaded Programming

INFO 7300 Engineering Cybersecure Software Systems

INFO 7390 Advances in Data Sciences and Architecture

Program Credit/GPA Requirements

16 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

409 Dana Research Center

617.373.7529

617.373.4431 (fax)

Faith Crisley, Student Service Coordinator, f.crisley@northeastern.edu

The Department of Electrical and Computer Engineering 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 communications, control, and signal processing; computer networks and security; computer systems and software; computer vision, machine learning and algorithms; electromagnetics, plasma, and optics; microsystems, materials, and devices; and power systems, power electronics, and motion control.

MSECE students pursue their degree by selecting one of the two tracks —MSECE with thesis and course track (MS/T) or MSECE course-only track (MS/C). 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. Full- and part-time students should follow 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. MS/T track students must complete an 8-semester-hour thesis as part of their program of study.

Students who select the MS/T 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 COURSE WORK ONLY 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 all concentrations except computer engineering related concentrations at least 24 semester hours of the 32 required semester hours must be graduate-level ECE courses. For students in the computer engineering related concentrations, i.e., 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.

Graduate Certificate Options

- Students enrolled in an MS in Electrical and Computer Engineering degree may also pursue one of 14 engineering graduate certificate options in conjunction with an Engineering Graduate Certificate. The selected option may result in an increase in total hours beyond that required for the master's degree only.
- Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Master of Science in Electrical and Computer Engineering Leadership (MSECEL) (p. 157) along with the Graduate Certificate in Engineering Leadership

COURSE REQUIREMENTS FOR THESIS 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 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." At least 16 semester hours of the required 24 semester hours must be graduate-level ECE courses. In addition, the program requires 8 semester hours of EECE 7990 Thesis.

Doctor of Philosophy Degree Requirements

The ECE department offers doctoral degree programs both in electrical and in computer engineering.

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 areas 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 six months 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 ECE faculty and the committee must include the student's advisor. The chair of the committee must be a 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 majority of 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

Within three years of the establishment of degree candidacy, 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.

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. However, 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 the PhD course requirements 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. 141)
- Computer Engineering—Advanced Entry (p. 141)
- Electrical Engineering (p. 141)
- Electrical Engineering—Advanced Entry (p. 142)

Master of Science in Electrical and Computer Engineering (MSECE)

- Electrical and Computer Engineering with Concentration in Communications, Control, and Signal Processing (p. 142)
- Electrical and Computer Engineering with Concentration in Computer Systems and Software (p. 144)
- Electrical and Computer Engineering with Concentration in Computer Networks and Security (p. 146)
- Electrical and Computer Engineering with Concentration in Computer Vision, Machine Learning, and Algorithms (p. 149)
- Electrical and Computer Engineering with Concentration in Electromagnetics, Plasma, and Optics (p. 151)
- Electrical and Computer Engineering with Concentration in Microsystems, Materials, and Devices (p. 153)
- Electrical and Computer Engineering with Concentration in Power Systems (p. 155)

Master of Science in Electrical and Computer Engineering Leadership (MSECEL)

- Electrical and Computer Engineering Leadership (p. 157)

Computer Engineering, PhD

The PhD program in computer engineering offers students an opportunity for study in a broad range of areas in computer engineering.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual Department of Electrical and Computer Engineering 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

0

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.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual Department of Electrical and Computer Engineering 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

0

Program Credit/GPA Requirements

16 total semester hours required
 Minimum 3.000 GPA required

Electrical Engineering, PhD

The PhD program in computer engineering offers students an opportunity for study in a broad range of areas in electrical engineering.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual ECE 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.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Annual ECE 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 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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply. *Note:* the selected option may result in an increase in total hours beyond that required for the master's degree only.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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 16 hours of advisor-approved Communications, Control, and Signal Processing technical courses.

Engineering Leadership (p. 163)

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.	20
--	----

Breadth Courses

Complete 8 semester hours from the breadth course list below.	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. 12

Breadth Courses

Complete 8 semester hours from the breadth course list below. 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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options. The selected option may result in an increase in total hours beyond that required for the master's degree only.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Course Lists

DEPTH COURSES

EECE 5576	Wireless Communication Systems	4
EECE 5580	Classical Control Systems	4
EECE 5610	Digital Control Systems	4
EECE 5626	Image Processing and Pattern Recognition	4
EECE 5644	Introduction to Machine Learning and Pattern Recognition	4
EECE 5664	Biomedical Signal Processing	4
EECE 5666	Digital Signal Processing	4
EECE 7200	Linear Systems Analysis	4
EECE 7204	Applied Probability and Stochastic Processes	4
EECE 7211	Nonlinear Control	4
EECE 7213	System Identification and Adaptive Control	4
EECE 7214	Optimal and Robust Control	4
EECE 7236	Special Topics in Control	4
EECE 7310	Modern Signal Processing	4
EECE 7311	Two Dimensional Signal and Image Processing	4
EECE 7312	Statistical and Adaptive Signal Processing	4
EECE 7313	Pattern Recognition	4
EECE 7323	Numerical Optimization Methods	4
EECE 7327	Special Topics in Signal Processing 1	4
EECE 7332	Error Correcting Codes	4
EECE 7334	Wireless Communications	4
EECE 7335	Detection and Estimation Theory	4
EECE 7336	Digital Communications	4
EECE 7337	Information Theory	4

EECE 7347	Special Topics in Communications 1	4
EECE 7397	Advanced Machine Learning	4

BREADTH COURSES

EECE 5606	Micro- and Nanofabrication	4
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS	4
EECE 5640	High-Performance Computing	4
EECE 5642	Data Visualization	4
EECE 5647	Nanophotonics	4
EECE 5648	Biomedical Optics	4
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology	4
EECE 5684	Power Electronics	4
EECE 5686	Electrical Machines	4
EECE 5688	Analysis of Unbalanced Power Grids	4
EECE 5694	Electromagnetic Photonic Devices	4
EECE 5695	Radio-Frequency and Optical Antennas	4
EECE 5696	Energy Harvesting Systems	4
EECE 5697	Acoustics and Sensing	4
EECE 7105	Optics for Engineers	4
EECE 7201	Solid State Devices	4
EECE 7202	Electromagnetic Theory 1	4
EECE 7205	Fundamentals of Computer Engineering	4
EECE 7220	Power System Analysis 2	4
EECE 7221	Power System Operation and Control	4
EECE 7224	Power Systems State Estimation	4
EECE 7226	Modeling and Simulation of Power System Transients	4
EECE 7238	Special Topics in Electric Drives	4
EECE 7239	Special Topics in Power Systems	4
EECE 7240	Analog Integrated Circuit Design	4
EECE 7241	Advanced Solid State Devices	4
EECE 7243	Integrated Circuit Fabrication	4
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)	4
EECE 7246	Design and Analysis of Digital Integrated Circuits	4
EECE 7247	Radio Frequency Integrated Circuit Design	4
EECE 7270	Electromagnetic Theory 2	4
EECE 7271	Computational Methods in Electromagnetics	4
EECE 7275	Antennas and Radiation	4
EECE 7276	Microwave Properties of Materials	4
EECE 7284	Optical Properties of Matter	4
EECE 7285	Opto-electronics and Fiber Optics	4
EECE 7287	Optical Detection	4
EECE 7295	Applied Magnetism	4
EECE 7296	Electronic Materials	4
EECE 7297	Advanced Magnetic Materials—Magnetic Devices	4
EECE 7298	Magnetic Materials—Fundamentals and Measurements	4

EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics	4
EECE 7352	Computer Architecture	4
EECE 7353	VLSI Design	4
EECE 7357	Fault-Tolerant Computers	4
EECE 7360	Combinatorial Optimization	4
EECE 7368	High-Level Design of Hardware-Software Systems	4
EECE 7370	Advanced Computer Vision	4
EECE 7374	Fundamentals of Computer Networks	4
EECE 7376	Operating Systems: Interface and Implementation	4
EECE 7390	Computer Hardware Security	4
EECE 7394	Networks and Systems Security	4
EECE 7399	Preparing High-Stakes Written and Oral Materials	4
EECE 7400	Special Problems in Electrical Engineering	1-4
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage	4
MATH 7232	Combinatorial Analysis	4
MATH 7233	Graph Theory	4
CS 5100	Foundations of Artificial Intelligence	4
CS 5200	Database Management Systems	4
CS 5310	Computer Graphics	4
CS 5340	Computer/Human Interaction	4
CS 5400	Principles of Programming Language	4
CS 5500	Managing Software Development	4
CS 5600	Computer Systems	4
CS 5770	Software Vulnerabilities and Security	4
CS 6110	Knowledge-Based Systems	4
CS 6200	Information Retrieval	4
CS 6310	Computational Imaging	4
CS 6410	Compilers	4
CS 6510	Advanced Software Development	4
CS 6520	Methods of Software Development	4
CS 6530	Analysis of Software Artifacts	4
CS 6540	Foundations of Formal Methods and Software Analysis	4
CS 6610	Parallel Computing	4
CS 6740	Network Security	4
CS 6750	Cryptography and Communications Security	4
CS 6760	Privacy, Security, and Usability	4
CS 6810	Distributed Algorithms	4
CS 7800	Advanced Algorithms	4

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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply. *Note:* the selected option may result in an increase in total hours beyond that required for the master's degree only.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree in Electrical and Computer Engineering with a concentration in Computer Systems and Software 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 16 hours of advisor-approved Computer Systems and Software technical courses.

Engineering Leadership (p. 163)

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. 20

Breadth Courses

Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. 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. 12

Breadth Courses

Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. 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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options. The selected option may result in an increase in total hours beyond that required for the master's degree only.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Course Lists

DEPTH COURSES

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
CS 7800	Advanced Algorithms
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 only)
EECE 7205	Fundamentals of Computer Engineering
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 7376	Operating Systems: Interface and Implementation
EECE 7390	Computer Hardware Security
EECE 7398	Special Topics (Compilers)
EECE 7398	Special Topics (Advanced Computer Architecture)

BREADTH COURSES

CS 5100	Foundations of Artificial Intelligence
CS 5310	Computer Graphics
CS 5340	Computer/Human Interaction
CS 5400	Principles of Programming Language
CS 5500	Managing Software Development
CS 5770	Software Vulnerabilities and Security
CS 6110	Knowledge-Based Systems
CS 6200	Information Retrieval
CS 6310	Computational Imaging
CS 6530	Analysis of Software Artifacts
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
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 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 7311	Two Dimensional Signal and Image Processing
EECE 5696	Energy Harvesting Systems	EECE 7312	Statistical and Adaptive Signal Processing
EECE 5697	Acoustics and Sensing	EECE 7313	Pattern Recognition
EECE 5698	Special Topics in Electrical and Computer Engineering (Introduction to Software Security)	EECE 7315	Digital Image Processing
EECE 7105	Optics for Engineers	EECE 7323	Numerical Optimization Methods
EECE 7200	Linear Systems Analysis	EECE 7327	Special Topics in Signal Processing 1
EECE 7201	Solid State Devices	EECE 7332	Error Correcting Codes
EECE 7202	Electromagnetic Theory 1	EECE 7334	Wireless Communications
EECE 7203	Complex Variable Theory and Differential Equations	EECE 7335	Detection and Estimation Theory
EECE 7204	Applied Probability and Stochastic Processes	EECE 7336	Digital Communications
EECE 7211	Nonlinear Control	EECE 7337	Information Theory
EECE 7212	Multivariable Control Systems	EECE 7347	Special Topics in Communications 1
EECE 7213	System Identification and Adaptive Control	EECE 7364	Mobile and Wireless Networking
EECE 7214	Optimal and Robust Control	EECE 7370	Advanced Computer Vision
EECE 7220	Power System Analysis 2	EECE 7374	Fundamentals of Computer Networks
EECE 7221	Power System Operation and Control	EECE 7394	Networks and Systems Security
EECE 7224	Power Systems State Estimation	EECE 7397	Advanced Machine Learning
EECE 7226	Modeling and Simulation of Power System Transients	EECE 7397	Advanced Machine Learning
EECE 7236	Special Topics in Control	EECE 7399	Preparing High-Stakes Written and Oral Materials
EECE 7238	Special Topics in Electric Drives	ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
EECE 7239	Special Topics in Power Systems	MATH 7233	Graph Theory
EECE 7240	Analog Integrated Circuit Design	MATH 7232	Combinatorial Analysis
EECE 7241	Advanced Solid State Devices		
EECE 7242	Integrated Circuits for Communications and Mixed-Signal Processing		
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 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 7309	Special Topics in Electromagnetics, Plasma, and Optics		
EECE 7310	Modern Signal Processing		

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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply. *Note:* the selected option may result in an increase in total hours beyond that required for the master's degree only.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)

- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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 16 hours of advisor-approved Computer Networks and Security technical courses.

Engineering Leadership (p. 163)

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. 20

Breadth Courses

Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. 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. 12

Breadth Courses

Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor. 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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options. The selected option may result in an increase in total hours beyond that required for the master's degree only.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Course Lists

DEPTH COURSES

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
EECE 5576	Wireless Communication Systems
EECE 5640	High-Performance Computing
EECE 5698	Special Topics in Electrical and Computer Engineering (Wireless Sensor Networks, Introduction to Software Security and Networks: Technology, Economics Social Interactions only)
EECE 7204	Applied Probability and Stochastic Processes
EECE 7205	Fundamentals of Computer Engineering
EECE 7352	Computer Architecture
EECE 7360	Combinatorial Optimization
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 only)

BREADTH COURSES

CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5310	Computer Graphics
CS 5340	Computer/Human Interaction
CS 5400	Principles of Programming Language
CS 5500	Managing Software Development

CS 5600	Computer Systems	EECE 7226	Modeling and Simulation of Power System Transients
CS 6110	Knowledge-Based Systems	EECE 7236	Special Topics in Control
CS 6200	Information Retrieval	EECE 7238	Special Topics in Electric Drives
CS 6310	Computational Imaging	EECE 7239	Special Topics in Power Systems
CS 6410	Compilers	EECE 7240	Analog Integrated Circuit Design
CS 6510	Advanced Software Development	EECE 7241	Advanced Solid State Devices
CS 6520	Methods of Software Development	EECE 7242	Integrated Circuits for Communications and Mixed-Signal Processing
CS 6530	Analysis of Software Artifacts	EECE 7243	Integrated Circuit Fabrication
CS 6540	Foundations of Formal Methods and Software Analysis	EECE 7244	Introduction to Microelectromechanical Systems (MEMS)
CS 7800	Advanced Algorithms	EECE 7245	Microwave Circuit Design for Wireless Communication
EECE 5580	Classical Control Systems	EECE 7246	Design and Analysis of Digital Integrated Circuits
EECE 5606	Micro- and Nanofabrication	EECE 7247	Radio Frequency Integrated Circuit Design
EECE 5610	Digital Control Systems	EECE 7270	Electromagnetic Theory 2
EECE 5626	Image Processing and Pattern Recognition	EECE 7271	Computational Methods in Electromagnetics
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS	EECE 7275	Antennas and Radiation
EECE 5639	Computer Vision	EECE 7276	Microwave Properties of Materials
EECE 5640	High-Performance Computing	EECE 7284	Optical Properties of Matter
EECE 5642	Data Visualization	EECE 7285	Opto-electronics and Fiber Optics
EECE 5643	Simulation and Performance Evaluation	EECE 7287	Optical Detection
EECE 5644	Introduction to Machine Learning and Pattern Recognition	EECE 7293	Modern Imaging
EECE 5647	Nanophotonics	EECE 7295	Applied Magnetism
EECE 5648	Biomedical Optics	EECE 7296	Electronic Materials
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology	EECE 7297	Advanced Magnetic Materials—Magnetic Devices
EECE 5664	Biomedical Signal Processing	EECE 7290	Plasma Engineering
EECE 5666	Digital Signal Processing	EECE 7298	Magnetic Materials—Fundamentals and Measurements
EECE 5680	Electric Drives	EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics
EECE 5684	Power Electronics	EECE 7310	Modern Signal Processing
EECE 5686	Electrical Machines	EECE 7311	Two Dimensional Signal and Image Processing
EECE 5688	Analysis of Unbalanced Power Grids	EECE 7312	Statistical and Adaptive Signal Processing
EECE 5694	Electromagnetic Photonic Devices	EECE 7313	Pattern Recognition
EECE 5695	Radio-Frequency and Optical Antennas	EECE 7315	Digital Image Processing
EECE 5696	Energy Harvesting Systems	EECE 7323	Numerical Optimization Methods
EECE 5697	Acoustics and Sensing	EECE 7327	Special Topics in Signal Processing 1
EECE 7105	Optics for Engineers	EECE 7334	Wireless Communications
EECE 7200	Linear Systems Analysis	EECE 7335	Detection and Estimation Theory
EECE 7201	Solid State Devices	EECE 7336	Digital Communications
EECE 7202	Electromagnetic Theory 1	EECE 7337	Information Theory
EECE 7203	Complex Variable Theory and Differential Equations	EECE 7347	Special Topics in Communications 1
EECE 7211	Nonlinear Control	EECE 7352	Computer Architecture
EECE 7212	Multivariable Control Systems	EECE 7353	VLSI Design
EECE 7213	System Identification and Adaptive Control	EECE 7357	Fault-Tolerant Computers
EECE 7214	Optimal and Robust Control	EECE 7364	Mobile and Wireless Networking
EECE 7220	Power System Analysis 2	EECE 7368	High-Level Design of Hardware-Software Systems
EECE 7221	Power System Operation and Control		
EECE 7224	Power Systems State Estimation		

EECE 7370	Advanced Computer Vision
EECE 7374	Fundamentals of Computer Networks
EECE 7376	Operating Systems: Interface and Implementation
EECE 7397	Advanced Machine Learning
EECE 7399	Preparing High-Stakes Written and Oral Materials
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory

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, 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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply. *Note:* the selected option may result in an increase in total hours beyond that required for the master's degree only.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)

- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Electrical and Computer Engineering with a concentration in Computer Vision and Machine Learning with Graduate Certificate in Engineering Leadership

Students may complete a master's degree in Electrical and Computer Engineering with a concentration in Computer Vision and Machine Learning 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 16 hours of advisor-approved Computer Vision and Machine Learning technical courses.

Engineering Leadership (p. 163)

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.	20
--	----

Breadth Courses

Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor.	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.	12
--	----

Breadth Courses

Complete 8 semester hours from the breadth course list below or other EECE courses chosen in consultation with a faculty advisor.	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
-----------	--------	---

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options. The selected option may result in an increase in total hours beyond that required for the master's degree only.

Complete 16 semester hours of graduate certificate course work. (p. 162)

Course Lists

DEPTH COURSES

CS 5100	Foundations of Artificial Intelligence
CS 6110	Knowledge-Based Systems
CS 6200	Information Retrieval
CS 6310	Computational Imaging
CS 6810	Distributed Algorithms
CS 7800	Advanced Algorithms
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 7204	Applied Probability and Stochastic Processes
EECE 7205	Fundamentals of Computer Engineering
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 (Human Centered Computing)
MATH 7232	Combinatorial Analysis
MATH 7233	Graph Theory

BREADTH COURSES

CS 5200	Database Management Systems
CS 5310	Computer Graphics
CS 5340	Computer/Human Interaction
CS 5400	Principles of Programming Language
CS 5500	Managing Software Development
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 6530	Analysis of Software Artifacts
CS 6540	Foundations of Formal Methods and Software Analysis
CS 6610	Parallel Computing
CS 6740	Network Security
CS 6750	Cryptography and Communications Security
CS 6760	Privacy, Security, and Usability
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 5642	Data Visualization
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 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 (Topics in Software Security)
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 7205	Fundamentals of Computer Engineering
EECE 7211	Nonlinear Control
EECE 7212	Multivariable Control Systems
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 7236	Special Topics in Control
EECE 7238	Special Topics in Electric Drives
EECE 7239	Special Topics in Power Systems
EECE 7240	Analog Integrated Circuit Design
EECE 7241	Advanced Solid State Devices
EECE 7242	Integrated Circuits for Communications and Mixed-Signal Processing
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

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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply. *Note:* the selected option may result in an increase in total hours beyond that required for the master's degree only.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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 16 hours

EECE 7247	Radio Frequency Integrated Circuit Design
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 7290	Plasma Engineering
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 7315	Digital Image Processing
EECE 7327	Special Topics in Signal Processing 1
EECE 7332	Error Correcting Codes
EECE 7334	Wireless Communications
EECE 7335	Detection and Estimation Theory
EECE 7336	Digital Communications
EECE 7337	Information Theory
EECE 7347	Special Topics in Communications 1
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 7394	Networks and Systems Security
EECE 7397	Advanced Machine Learning
EECE 7398	Special Topics (Compilers)
EECE 7399	Preparing High-Stakes Written and Oral Materials
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

of advisor-approved Electromagnetics, Plasma, and Optics technical courses.

Engineering Leadership (p. 163)

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. 20

Breadth Courses

Note: Depth courses cannot be taken for breadth.

Complete 8 semester hours from the breadth course list below. 8

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. 12

Breadth Courses

Note: Depth courses cannot be taken for breadth.

Complete 8 semester hours from the breadth course list below. 8

Elective

Complete 4 additional semester hours from either depth or breadth courses. 4

Thesis

EECE 7990 Thesis 8

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options. The selected option may result in an increase in total hours beyond that required for the master's degree only.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Course Lists

DEPTH COURSES

EECE 5648	Biomedical Optics	4
EECE 5694	Electromagnetic Photonic Devices	4
EECE 5695	Radio-Frequency and Optical Antennas	4
EECE 5697	Acoustics and Sensing	4
EECE 7105	Optics for Engineers	4
EECE 7200	Linear Systems Analysis	4
EECE 7202	Electromagnetic Theory 1	4
EECE 7203	Complex Variable Theory and Differential Equations	4
EECE 7270	Electromagnetic Theory 2	4

EECE 7271	Computational Methods in Electromagnetics	4
EECE 7275	Antennas and Radiation	4
EECE 7276	Microwave Properties of Materials	4
EECE 7284	Optical Properties of Matter	4
EECE 7285	Opto-electronics and Fiber Optics	4
EECE 7287	Optical Detection	4
EECE 7293	Modern Imaging	4
EECE 7295	Applied Magnetism	4
EECE 7296	Electronic Materials	4
EECE 7297	Advanced Magnetic Materials—Magnetic Devices	4
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics	4

BREADTH COURSES

EECE 5576	Wireless Communication Systems	4
EECE 5580	Classical Control Systems	4
EECE 5606	Micro- and Nanofabrication	4
EECE 5610	Digital Control Systems	4
EECE 5626	Image Processing and Pattern Recognition	4
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS	4
EECE 5639	Computer Vision	4
EECE 5640	High-Performance Computing	4
EECE 5642	Data Visualization	4
EECE 5644	Introduction to Machine Learning and Pattern Recognition	4
EECE 5647	Nanophotonics	4
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology	4
EECE 5664	Biomedical Signal Processing	4
EECE 5666	Digital Signal Processing	4
EECE 5680	Electric Drives	4
EECE 5682	Power Systems Analysis 1	4
EECE 5684	Power Electronics	4
EECE 5686	Electrical Machines	4
EECE 5688	Analysis of Unbalanced Power Grids	4
EECE 5696	Energy Harvesting Systems	4
EECE 7200	Linear Systems Analysis	4
EECE 7201	Solid State Devices	4
EECE 7204	Applied Probability and Stochastic Processes	4
EECE 7205	Fundamentals of Computer Engineering	4
EECE 7211	Nonlinear Control	4
EECE 7213	System Identification and Adaptive Control	4
EECE 7214	Optimal and Robust Control	4
EECE 7220	Power System Analysis 2	4
EECE 7221	Power System Operation and Control	4
EECE 7224	Power Systems State Estimation	4
EECE 7226	Modeling and Simulation of Power System Transients	4

EECE 7236	Special Topics in Control	4
EECE 7237	Special Topics in Power Electronics	4
EECE 7238	Special Topics in Electric Drives	4
EECE 7240	Analog Integrated Circuit Design	4
EECE 7241	Advanced Solid State Devices	4
EECE 7242	Integrated Circuits for Communications and Mixed-Signal Processing	4
EECE 7243	Integrated Circuit Fabrication	4
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)	4
EECE 7310	Modern Signal Processing	4
EECE 7311	Two Dimensional Signal and Image Processing	4
EECE 7312	Statistical and Adaptive Signal Processing	4
EECE 7313	Pattern Recognition	4
EECE 7315	Digital Image Processing	4
EECE 7323	Numerical Optimization Methods	4
EECE 7327	Special Topics in Signal Processing 1	4
EECE 7332	Error Correcting Codes	4
EECE 7334	Wireless Communications	4
EECE 7335	Detection and Estimation Theory	4
EECE 7336	Digital Communications	4
EECE 7337	Information Theory	4
EECE 7347	Special Topics in Communications 1	4
EECE 7352	Computer Architecture	4
EECE 7353	VLSI Design	4
EECE 7357	Fault-Tolerant Computers	4
EECE 7360	Combinatorial Optimization	4
EECE 7364	Mobile and Wireless Networking	4
EECE 7368	High-Level Design of Hardware-Software Systems	4
EECE 7370	Advanced Computer Vision	4
EECE 7374	Fundamentals of Computer Networks	4
EECE 7376	Operating Systems: Interface and Implementation	4
EECE 7390	Computer Hardware Security	4
EECE 7394	Networks and Systems Security	4
EECE 7397	Advanced Machine Learning	4
EECE 7399	Preparing High-Stakes Written and Oral Materials	4
EECE 7400	Special Problems in Electrical Engineering	1-4
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage	4
MATH 7232	Combinatorial Analysis	4
MATH 7233	Graph Theory	4
CS 5100	Foundations of Artificial Intelligence	4
CS 5200	Database Management Systems	4
CS 5310	Computer Graphics	4
CS 5340	Computer/Human Interaction	4
CS 5400	Principles of Programming Language	4
CS 5500	Managing Software Development	4
CS 5600	Computer Systems	4
CS 5770	Software Vulnerabilities and Security	4

CS 6110	Knowledge-Based Systems	4
CS 6200	Information Retrieval	4
CS 6310	Computational Imaging	4
CS 6410	Compilers	4
CS 6510	Advanced Software Development	4
CS 6520	Methods of Software Development	4
CS 6530	Analysis of Software Artifacts	4
CS 6540	Foundations of Formal Methods and Software Analysis	4
CS 6610	Parallel Computing	4
CS 6740	Network Security	4
CS 6750	Cryptography and Communications Security	4
CS 6760	Privacy, Security, and Usability	4
CS 6810	Distributed Algorithms	4
CS 7800	Advanced Algorithms	4

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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply. *Note:* the selected option may result in an increase in total hours beyond that required for the master's degree only.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)

- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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’s degree 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 16 hours of advisor-approved Microsystems, Materials, and Devices technical courses.

Engineering Leadership (p. 163)

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. 20

Breadth Courses

Complete 8 semester hours from the breadth course list below. 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. 12

Breadth Courses

Complete 8 semester hours from the breadth course list below. 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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master’s degree. Students should consult their faculty advisor regarding the certificate options. The selected option may result in an increase in total hours beyond that required for the master’s degree only.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Course Lists

DEPTH COURSES

EECE 5606	Micro- and Nanofabrication	4
EECE 5647	Nanophotonics	4
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology	4
EECE 5696	Energy Harvesting Systems	4
EECE 7201	Solid State Devices	4
EECE 7240	Analog Integrated Circuit Design	4
EECE 7241	Advanced Solid State Devices	4
EECE 7242	Integrated Circuits for Communications and Mixed-Signal Processing	4
EECE 7243	Integrated Circuit Fabrication	4
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)	4
EECE 7245	Microwave Circuit Design for Wireless Communication	4
EECE 7246	Design and Analysis of Digital Integrated Circuits	4
EECE 7247	Radio Frequency Integrated Circuit Design	4
EECE 7276	Microwave Properties of Materials	4
EECE 7284	Optical Properties of Matter	4
EECE 7295	Applied Magnetism	4
EECE 7296	Electronic Materials	4
EECE 7297	Advanced Magnetic Materials—Magnetic Devices	4
EECE 7298	Magnetic Materials—Fundamentals and Measurements	4
EECE 7353	VLSI Design	4

BREADTH COURSES

EECE 5576	Wireless Communication Systems	4
EECE 5580	Classical Control Systems	4
EECE 5610	Digital Control Systems	4
EECE 5626	Image Processing and Pattern Recognition	4
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS	4
EECE 5639	Computer Vision	4
EECE 5640	High-Performance Computing	4
EECE 5642	Data Visualization	4
EECE 5644	Introduction to Machine Learning and Pattern Recognition	4
EECE 5664	Biomedical Signal Processing	4
EECE 5666	Digital Signal Processing	4
EECE 5682	Power Systems Analysis 1	4

EECE 5684	Power Electronics	4	ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage	4
EECE 5686	Electrical Machines	4	MATH 7232	Combinatorial Analysis	4
EECE 5688	Analysis of Unbalanced Power Grids	4	MATH 7233	Graph Theory	4
EECE 5694	Electromagnetic Photonic Devices	4	CS 5100	Foundations of Artificial Intelligence	4
EECE 5695	Radio-Frequency and Optical Antennas	4	CS 5200	Database Management Systems	4
EECE 5697	Acoustics and Sensing	4	CS 5310	Computer Graphics	4
EECE 7200	Linear Systems Analysis	4	CS 5340	Computer/Human Interaction	4
EECE 7202	Electromagnetic Theory 1	4	CS 5400	Principles of Programming Language	4
EECE 7205	Fundamentals of Computer Engineering	4	CS 5500	Managing Software Development	4
EECE 7211	Nonlinear Control	4	CS 5600	Computer Systems	4
EECE 7213	System Identification and Adaptive Control	4	CS 5770	Software Vulnerabilities and Security	4
EECE 7214	Optimal and Robust Control	4	CS 6110	Knowledge-Based Systems	4
EECE 7220	Power System Analysis 2	4	CS 6200	Information Retrieval	4
EECE 7221	Power System Operation and Control	4	CS 6310	Computational Imaging	4
EECE 7224	Power Systems State Estimation	4	CS 6410	Compilers	4
EECE 7226	Modeling and Simulation of Power System Transients	4	CS 6510	Advanced Software Development	4
EECE 7236	Special Topics in Control	4	CS 6520	Methods of Software Development	4
EECE 7237	Special Topics in Power Electronics	4	CS 6530	Analysis of Software Artifacts	4
EECE 7238	Special Topics in Electric Drives	4	CS 6540	Foundations of Formal Methods and Software Analysis	4
EECE 7239	Special Topics in Power Systems	4	CS 6610	Parallel Computing	4
EECE 7310	Modern Signal Processing	4	CS 6740	Network Security	4
EECE 7311	Two Dimensional Signal and Image Processing	4	CS 6750	Cryptography and Communications Security	4
EECE 7312	Statistical and Adaptive Signal Processing	4	CS 6760	Privacy, Security, and Usability	4
EECE 7313	Pattern Recognition	4	CS 6810	Distributed Algorithms	4
EECE 7315	Digital Image Processing	4	CS 7800	Advanced Algorithms	4
EECE 7323	Numerical Optimization Methods	4			
EECE 7327	Special Topics in Signal Processing 1	4			
EECE 7332	Error Correcting Codes	4			
EECE 7334	Wireless Communications	4			
EECE 7335	Detection and Estimation Theory	4			
EECE 7336	Digital Communications	4			
EECE 7337	Information Theory	4			
EECE 7347	Special Topics in Communications 1	4			
EECE 7352	Computer Architecture	4			
EECE 7357	Fault-Tolerant Computers	4			
EECE 7360	Combinatorial Optimization	4			
EECE 7364	Mobile and Wireless Networking	4			
EECE 7368	High-Level Design of Hardware-Software Systems	4			
EECE 7370	Advanced Computer Vision	4			
EECE 7374	Fundamentals of Computer Networks	4			
EECE 7376	Operating Systems: Interface and Implementation	4			
EECE 7390	Computer Hardware Security	4			
EECE 7394	Networks and Systems Security	4			
EECE 7397	Advanced Machine Learning	4			
EECE 7399	Preparing High-Stakes Written and Oral Materials	4			
EECE 7400	Special Problems in Electrical Engineering	1-4			

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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply. *Note:* the selected option may result in an increase in total hours beyond that required for the master's degree only.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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 16 hours of advisor-approved Power Systems technical courses.

Engineering Leadership (p. 163)

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. 20

Breadth Courses

Complete 8 semester hours from the breadth course list below. 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. 12

Breadth Courses

Complete 8 semester hours from the breadth course list below. 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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options. The selected option may result in an increase in total hours beyond that required for the master's degree only.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Course Lists

DEPTH COURSES

EECE 5580	Classical Control Systems	4
EECE 5610	Digital Control Systems	4
EECE 5666	Digital Signal Processing	4
EECE 5680	Electric Drives	4
EECE 5682	Power Systems Analysis 1	4
EECE 5684	Power Electronics	4
EECE 5686	Electrical Machines	4
EECE 5688	Analysis of Unbalanced Power Grids	4
EECE 5696	Energy Harvesting Systems	4
EECE 7200	Linear Systems Analysis	4
EECE 7211	Nonlinear Control	4
EECE 7213	System Identification and Adaptive Control	4
EECE 7214	Optimal and Robust Control	4
EECE 7220	Power System Analysis 2	4
EECE 7221	Power System Operation and Control	4
EECE 7224	Power Systems State Estimation	4
EECE 7226	Modeling and Simulation of Power System Transients	4
EECE 7236	Special Topics in Control	4
EECE 7237	Special Topics in Power Electronics	4
EECE 7238	Special Topics in Electric Drives	4
EECE 7239	Special Topics in Power Systems	4
EECE 7323	Numerical Optimization Methods	4
EECE 7335	Detection and Estimation Theory	4
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage	4

BREADTH COURSES

EECE 5606	Micro- and Nanofabrication	4
EECE 5626	Image Processing and Pattern Recognition	4
EECE 5627	Arithmetic and Circuit Design for Inexact Computing with Nanoscaled CMOS	4

EECE 5639	Computer Vision	4	EECE 7352	Computer Architecture	4
EECE 5640	High-Performance Computing	4	EECE 7353	VLSI Design	4
EECE 5642	Data Visualization	4	EECE 7357	Fault-Tolerant Computers	4
EECE 5644	Introduction to Machine Learning and Pattern Recognition	4	EECE 7360	Combinatorial Optimization	4
EECE 5647	Nanophotonics	4	EECE 7368	High-Level Design of Hardware-Software Systems	4
EECE 5649	Design of Analog Integrated Circuits with Complementary Metal-Oxide-Semiconductor Technology	4	EECE 7370	Advanced Computer Vision	4
EECE 5664	Biomedical Signal Processing	4	EECE 7374	Fundamentals of Computer Networks	4
EECE 5694	Electromagnetic Photonic Devices	4	EECE 7376	Operating Systems: Interface and Implementation	4
EECE 5695	Radio-Frequency and Optical Antennas	4	EECE 7390	Computer Hardware Security	4
EECE 5697	Acoustics and Sensing	4	EECE 7394	Networks and Systems Security	4
EECE 7105	Optics for Engineers	4	EECE 7397	Advanced Machine Learning	4
EECE 7201	Solid State Devices	4	EECE 7399	Preparing High-Stakes Written and Oral Materials	4
EECE 7202	Electromagnetic Theory 1	4	EECE 7400	Special Problems in Electrical Engineering	1-4
EECE 7203	Complex Variable Theory and Differential Equations	4	MATH 7232	Combinatorial Analysis	4
EECE 7204	Applied Probability and Stochastic Processes	4	MATH 7233	Graph Theory	4
EECE 7205	Fundamentals of Computer Engineering	4	CS 5100	Foundations of Artificial Intelligence	4
EECE 7240	Analog Integrated Circuit Design	4	CS 5200	Database Management Systems	4
EECE 7241	Advanced Solid State Devices	4	CS 5310	Computer Graphics	4
EECE 7242	Integrated Circuits for Communications and Mixed-Signal Processing	4	CS 5340	Computer/Human Interaction	4
EECE 7243	Integrated Circuit Fabrication	4	CS 5400	Principles of Programming Language	4
EECE 7244	Introduction to Microelectromechanical Systems (MEMS)	4	CS 5500	Managing Software Development	4
EECE 7245	Microwave Circuit Design for Wireless Communication	4	CS 5600	Computer Systems	4
EECE 7246	Design and Analysis of Digital Integrated Circuits	4	CS 5770	Software Vulnerabilities and Security	4
EECE 7247	Radio Frequency Integrated Circuit Design	4	CS 6110	Knowledge-Based Systems	4
EECE 7270	Electromagnetic Theory 2	4	CS 6200	Information Retrieval	4
EECE 7271	Computational Methods in Electromagnetics	4	CS 6310	Computational Imaging	4
EECE 7275	Antennas and Radiation	4	CS 6410	Compilers	4
EECE 7276	Microwave Properties of Materials	4	CS 6510	Advanced Software Development	4
EECE 7284	Optical Properties of Matter	4	CS 6520	Methods of Software Development	4
EECE 7285	Opto-electronics and Fiber Optics	4	CS 6530	Analysis of Software Artifacts	4
EECE 7287	Optical Detection	4	CS 6540	Foundations of Formal Methods and Software Analysis	4
EECE 7293	Modern Imaging	4	CS 6610	Parallel Computing	4
EECE 7295	Applied Magnetism	4	CS 6740	Network Security	4
EECE 7296	Electronic Materials	4	CS 6750	Cryptography and Communications Security	4
EECE 7297	Advanced Magnetic Materials—Magnetic Devices	4	CS 6760	Privacy, Security, and Usability	4
EECE 7298	Magnetic Materials—Fundamentals and Measurements	4	CS 6810	Distributed Algorithms	4
EECE 7309	Special Topics in Electromagnetics, Plasma, and Optics	4	CS 7800	Advanced Algorithms	4
EECE 7310	Modern Signal Processing	4			
EECE 7312	Statistical and Adaptive Signal Processing	4			
EECE 7327	Special Topics in Signal Processing 1	4			
EECE 7347	Special Topics in Communications 1	4			

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 the approved depth/breadth course lists within the seven EECE concentrations.	16
---	----

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

Energy Systems

Website (<http://www.coe.neu.edu/degrees/ms-es>)

Gregory J. Kowalski, PhD

Associate Professor and Program Director

205 Snell Engineering

617.373.2971

617.373.2921 (fax)

Gregory J. Kowalski, PhD, Associate Professor and Director of Energy Systems, gkowal@coe.neu.edu

The Master of Science degree program in energy systems (MSENEs) integrates the technology side of energy systems development with the financial planning needed to effectively implement them. The goal of the MSENEs is to create a high-level signature, interdisciplinary graduate

program for the engineer or technical business major who is pursuing an industrial or public-planning-based career.

The program curriculum is firmly rooted in energy technology and includes exposure to the interface with business and financial decision processes. 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 at this interface who have successfully implemented energy systems or devices and policies are actively involved in the program as adjunct professors and invited speakers. The curriculum is flexibly designed with a set of six core courses in engineering knowledge and finance and four electives that can be taken from any department within the College of Engineering.

Through this curriculum and interaction with practitioners, the 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.

The degree requirements are successful completion of a minimum 35.5 semester hours of course work. The curriculum can be completed through either a cooperative education (co-op) or non-co-op track. The total semester hours required for the co-op track will be 36.5. The six-month co-op rotation in companies or the public sector involved in energy activities is a recommended component of the program. To provide flexibility to satisfy the mission of the program, a program of study will be prepared by the student and program director during the first term of study. This program of study will reflect the student's career goals and will insure that all technical and financial educational competencies are satisfied. All successful degree candidates will have demonstrated sufficient engineering competency as measured by the successful completion of the courses. The required course distribution is shown in the table below.

Mission Statement

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.

Admission Criteria

Applicants to the program are expected to have either an undergraduate degree from an accredited engineering school or have a quantitative business or finance degree. Applicants are expected to have adequate computer skills and college-level calculus. Foundational course work in these fields is available to students to bridge any gap in their technical backgrounds. However, credit for such courses will not count toward the degree. The successful applicant should have an undergraduate grade-point average (GPA) of 3.000/4.000 or higher from an accredited U.S. school. International applicants, in addition to the minimum 3.000/4.000 GPA requirement, should submit GRE and TOEFL scores with a minimum 151 (650) (Quantitative) and 550 (paper-based),

213 (computer-based), or 80 (internet-based), respectively. The applicant will also submit:

- An application to the Graduate School of Engineering.
- A one-page description of their interest and expectations of the program, focusing on their career path. This essay should be placed in the application under the heading "PhD Applicants, Area of Interest."

Graduate Certificate Options

Students enrolled in a master's degree in Energy Systems have the opportunity to also pursue one of 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Programs

Master of Science in Energy Systems (MSENEs)

- Energy Systems (p. 159)

Graduate Certificates

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Energy Systems, MS

This program includes an online/hybrid delivery option. Course work for this option is offered online. Students enrolled at a regional campus may enroll in specific hybrid delivery sections of these courses. Hybrid courses have periodic face-to-face regional campus meetings.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)

- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Energy Systems with Graduate Certificate in Engineering Leadership

Students may complete a master's degree 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 39.5 semester hour degree and certificate will require 16 hours of advisor-approved Energy Systems technical courses.

Engineering Leadership (p. 163)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

ACCT 6200	Financial Reporting and Managerial Decision Making 1	3
ACCT 6201	Financial Reporting and Managerial Decision Making 2	1.5
EMGT 6225	Economic Decision Making	4
ENSY 5000	Fundamentals of Energy System Integration	4
FINA 6200	Value Creation through Financial Decision Making	3
ME 6200	Mathematical Methods for Mechanical Engineers 1	4

Options

Complete one of the following options:

GENERAL OPTION

Complete 16 semester hours from the following: 16

OR 6205	Deterministic Operations Research	
ARCH 5210 and ARCH 5211	Environmental Systems and Recitation for ARCH 5210	
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
ENSY 5585	Wind Energy Systems
ENSY 7374	Special Topics in Energy Systems
ENSY 7978	Independent Study
LPSC 7312	Cities, Sustainability, and Climate Change
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
PPUA 7238	Climate Change and Urbanization in Developing Countries

Program Credit/GPA Requirements

35.5 total semester hours required
 Minimum 3.000 GPA required

ONLINE/HYBRID OPTION

Complete 16 semester hours from the following: 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

35.5 total semester hours required
 Minimum 3.000 GPA required

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree.

Required Course Work

Complete 16 semester hours of graduate certificate required course work. (p. 162) 16

Elective

ENSY elective from list under general option 4

Program Credit/GPA Requirements for Certificate Option

39.5 total semester hours required
 Minimum 3.000 GPA required

**Plan of Study
 Sample Curriculum**

Below is a sample curriculum for either the co-op or non-co-op tracks.

TECHNICAL BACKGROUND TRACK WITH CO-OP

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ENSY 5000	4	ACCT 6200	3	Elective	4	ENSY 6964	0
EMGT 6225	4	ENCP 6000	1				
ME 6200	4	Elective	4				
		Elective	4				
		12		12		4	
						0	

Year 2

Fall	Hours	Spring	Hours
ENSY 6964	0	ACCT 6201	1.5
		FINA 6200	3
		Elective	4
		0	
		8.5	

Total Hours: 36.5

NON CO-OP TRACK

Year 1

Fall	Hours	Spring	Hours
ENSY 5000	4	ACCT 6200	3
ME 6200	4	EMGT 6225	4
		Elective	4
		8	
		11	

Year 2

Fall	Hours	Spring	Hours
FINA 6200	3	Elective	4
ACCT 6201	1.5	Elective	4
Elective	4		
		8.5	
		8	

Total Hours: 35.5

Energy Systems Graduate Certificates

- Renewable Energy (p. 160)
- Energy Systems (p. 161)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Renewable Energy, Graduate Certificate

The Graduate Certificate in Renewable Energy focuses on the combination of analysis and integration of energy systems engineering technology with key renewable engineering technology, including solar and wind generation, with environmental protection and manufacturing considerations.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of engineering knowledge and skills to analyze energy systems with a specific focus on renewable energy technologies along with EPA regulatory structure, including the

LEED certification program, as well as industrial ecology, including life-cycle analysis and technical cost modeling.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses

ENSY 5000	Fundamentals of Energy System Integration	4
ENSY 7374	Special Topics in Energy Systems	4
ME 5685	Solar Thermal Engineering	4

Elective

Complete one of the following: 4		
CIVE 5270	Environmental Protection and Management	
EECE 5682	Power Systems Analysis 1	
ME 5645	Environmental Issues in Manufacturing and Product Use	

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Energy Systems, Graduate Certificate

The energy systems graduate certificate program focuses on the combination of analysis and integration of energy systems engineering technology with financial planning and attention to business aspects and effective implementation.

This four-course graduate certificate seeks to offer students opportunities to apply the fundamentals of engineering knowledge and skills to analyze energy systems to propose effective and efficient technology solutions based on data-driven and economic-based decisions.

Note: MS in Energy Systems students are not eligible for this graduate certificate.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses

EMGT 6225	Economic Decision Making	4
EMGT 6305	Financial Management for Engineers	4
ENSY 5000	Fundamentals of Energy System Integration	4

Elective

Complete one of the following: 4		
CIVE 5270	Environmental Protection and Management	
ME 5645	Environmental Issues in Manufacturing and Product Use	

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Energy Systems Management, Graduate Certificate

The energy systems management graduate certificate program focuses on the combination of analysis and integration of energy systems engineering technology with a focus on the art and the science of planning, organizing, allocating, directing, and controlling the activities and resources of organizations engaged in engineering activities and technology development.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of engineering knowledge and skills in a management setting to analyze energy systems and to propose effective and efficient technology solutions based on data-driven and economic-based decisions.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses

ENSY 5000	Fundamentals of Energy System Integration	4
EMGT 5220	Engineering Project Management	4

Electives

Complete one of the following: 4		
EMGT 5300	Engineering/Organizational Psychology	
EMGT 6225	Economic Decision Making	
EMGT 6305	Financial Management for Engineers	
IE 6200	Engineering Probability and Statistics	
OR 6205	Deterministic Operations Research	

Complete one of the following: 4		
CIVE 5270	Environmental Protection and Management	
ENSY 5585	Wind Energy Systems	
ME 5645	Environmental Issues in Manufacturing and Product Use	

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Sustainable Energy Systems, Graduate Certificate

The Graduate Certificate in Sustainable Energy Systems focuses on the integration of energy systems engineering technology with sustainable building systems, including the design and operation of buildings with minimal energy and environmental impact.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of engineering knowledge and skills to analyze energy systems as they relate to sustainable engineering building design with a focus on renewable energy with LEED certification or with a focus on industrial ecology, including life-cycle analysis and technical cost modeling.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses

SBSY 5200	Sustainable Engineering Systems for Buildings	4
ENSY 5000	Fundamentals of Energy System Integration	4

Electives

Complete two of the following: 8

CIVE 5270	Environmental Protection and Management
ENSY 5585	Wind Energy Systems
ME 5645	Environmental Issues in Manufacturing and Product Use
ME 5685	Solar Thermal Engineering

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Graduate Certificate Programs

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Gordon Institute of Engineering Leadership

- Engineering Leadership (p. 163)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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 Engineering Leadership Graduate Certificate 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
- Master of Science in Chemical Engineering
- Master of Science in Civil Engineering—Select Master of Science concentration
- Master of Science in Computer Systems Engineering
- Master of Science in Electrical and Computer Engineering—Select Master of Science concentration
- Master of Science in Electrical and Computer Engineering Leadership
- Master of Science in Energy Systems
- Master of Science in Engineering Management
- Master of Science in Industrial Engineering
- Master of Science in Information Systems
- Master of Science in Mechanical Engineering—Select Master of Science concentration
- Master of Science in Operations Research
- Master of Science in Sustainable Building Systems
- Master of Science 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. 163).

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
- Master of Science in Chemical Engineering
- Master of Science in Civil Engineering—Select Master of Science concentration
- Master of Science in Computer Systems Engineering
- Master of Science in Electrical and Computer Engineering—Select Master of Science concentration
- Master of Science in Electrical and Computer Engineering Leadership
- Master of Science in Energy Systems
- Master of Science in Engineering Management
- Master of Science in Industrial Engineering
- Master of Science in Information Systems
- Master of Science in Mechanical Engineering—Select Master of Science concentration
- Master of Science in Operations Research
- Master of Science in Sustainable Building Systems
- Master of Science 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.

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Engineering Management

Website (http://www.mie.neu.edu/degrees/ms-em/#_ga=12490377606902590881443725887)

Thomas P. Cullinane, PhD

Professor and Program Director

334 Snell Engineering
617.373.4851
617.373.2921 (fax)
t.cullinane@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 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 product managers or leaders of teams in technical 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 these assignments 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.”

Graduate Certificate Options

Students enrolled in a master's degree in Engineering Management have the opportunity to also pursue one of 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Programs

Master of Science in Engineering Management (MSEM)

- Engineering Management (p. 165)

Graduate Certificates

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Engineering Management, MSEM

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 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 degree requirements by taking online courses.

Degree Requirements

Degree Requirements	Course Work Only With Project	With Thesis
Required and elective courses	32 SH	24 SH
Project/thesis	0 SH	8 SH

Minimum semester hours required	32 SH	32 SH	32 SH
---------------------------------	-------	-------	-------

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Engineering Management with Graduate Certificate in Engineering Leadership

Students may complete a master's degree 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. 163)

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 of approved electives below. 16

Note: Other approved courses may be chosen in consultation with an academic advisor.

PROJECT OPTION

EMGT 7945 Master's Project 4

Complete 12 semester hours from the course list of approved electives below. 12

Note: Other approved courses may be chosen in consultation with an academic advisor.

THESIS OPTION

EMGT 7990 Thesis 8

Complete 8 semester hours from the course list of approved electives below. 8

Note: Other approved courses may be chosen in consultation with an academic advisor.

ONLINE OPTION

Complete 16 semester hours from the following list of online 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	
INFO 6245	Planning and Managing Information Systems Development	
INFO 7245	Agile Software Development	
INFO 7365	Enterprise Architecture Planning and Management	

INFO 7275	Advanced Database Management Systems	
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	

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate required course work. (p. 162) 16

Course List for Approved Electives

CSYE 6200	Concepts of Object-Oriented Design	4
CSYE 6205	Concepts of Object-Oriented Design with C++	4
CSYE 6210	Component Software Development	4
CSYE 6220	Enterprise Software Design	4
CSYE 7230	Software Engineering	4
CSYE 7270	Building Virtual Environments	4
CSYE 7280	User Experience Design and Testing	4
ENSY 5000	Fundamentals of Energy System Integration	4
EMGT 5300	Engineering/Organizational Psychology	4
EMGT 6305	Financial Management for Engineers	4
EMGT 7978	Independent Study	1 - 4
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
GE 5100	Product Development for Engineers	4
IE 5400	Healthcare Systems Modeling and Analysis	4
IE 5500	Systems Engineering in Public Programs	4
IE 5617	Lean Concepts and Applications	4
IE 5620	Mass Customization	4
IE 5640	Data Mining for Engineering Applications	4
IE 6300	Manufacturing Methods and Processes	4
IE 7200	Supply Chain Engineering	4
IE 7215	Simulation Analysis	4
IE 7255	Manufacturing Processes	4
IE 7270	Intelligent Manufacturing	4
IE 7275	Data Mining in Engineering	4
IE 7280	Statistical Methods in Engineering	4
IE 7285	Statistical Quality Control	4
IE 7290	Reliability Analysis and Risk Assessment	4
IE 7315	Human Factors Engineering	4

IE 7615	Neural Networks in Engineering	4
INFO 6210	Data Management and Database Design	4
INFO 6215	Business Analysis and Information Engineering	4
INFO 6245	Planning and Managing Information Systems Development	4
INFO 7245	Agile Software Development	4
INFO 7260	Business Process Engineering	4
INFO 7275	Advanced Database Management Systems	4
INFO 7285	Organizational Change and IT	4
INFO 7290	Data Warehousing and Business Intelligence	4
INFO 7330	Information Systems for Healthcare-Services Delivery	4
INFO 7365	Enterprise Architecture Planning and Management	4
INFO 7390	Advances in Data Sciences and Architecture	4
MGSC 6206	Management of Service and Manufacturing Operations	3
OR 7230	Probabilistic Operation Research	4
OR 7235	Inventory Theory	4
OR 7240	Integer and Nonlinear Optimization	4
OR 7245	Network Analysis and Advanced Optimization	4
OR 7250	Multi-Criteria Decision Making	4
OR 7310	Logistics, Warehousing, and Scheduling	4
SCHM 6212	Executive Roundtable in Supply Chain Management	3
SCHM 6214	Sourcing and Procurement	3
SCHM 6215	Supply Chain Analytics	3
SCHM 6221	Sustainability and Supply Chain Management	3
SCHM 6222	Managing Emerging Issues in Supply Chain Management	3
SCHM 6223	Managing Healthcare Supply Chain Operations	3
SCHM 6224	Demand Planning and Forecasting	3
TECE 6200	Innovation and Entrepreneurial Growth	3
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
TELE 5310	Fundamentals of Communication Systems	4
TELE 5330	Data Networking	4

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

Engineering Management Graduate Certificates

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Engineering Business, Graduate Certificate

The engineering business graduate certificate program involves eight courses with academic and participation elements. The program offers students opportunities to apply the technical aspects of an engineering skill foundation in corporate settings. This equips them to manage projects, lead people, make data-driven and market-based decisions, and advance economically sound initiatives.

To earn the engineering business certificate, students must have completed in good standing a BS(Engineering)/MS[Engineering Management] program at Northeastern or an MS(Engineering Management) with a BS(Engineering) also from Northeastern; have been accepted through application and committee admission to the Galante Engineering Business Program; participated in the Galante Engineering Business Program cocurricular elements; and taken four specified business-skill courses in the College of Engineering graduate school as listed under the Program Requirements tab in addition to the four required core engineering management courses.

Refer to the Galante Engineering Business Program web page (<http://www.coe.neu.edu/galante>) for additional details and description.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Course Requirements

Technological Entrepreneurship

Complete 4 semester hours from the following: 4

GE 5100 Product Development for Engineers

GE 5010 Customer-Driven Technical Innovation for Engineers

Managing People and Organizations

EMGT 5300 Engineering/Organizational Psychology 4

Financial Analysis

EMGT 6305 Financial Management for Engineers 4

Information Analysis

IE 5640 Data Mining for Engineering Applications 4

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.400 GPA required

Engineering Management, Graduate Certificate

The engineering management graduate certificate program focuses on bridging the gaps between the fields of engineering, technology, and business with a focus on the art and the science of planning, organizing,

allocating, directing, and controlling the activities and resources of organizations engaged in engineering activities and technology development.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of engineering knowledge and skills in a management setting to build decision-making models and make data-driven and/or economic-based decisions.

Note: Students enrolled in the master's in engineering management program are not eligible for this graduate certificate.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses

EMGT 5220	Engineering Project Management	4
EMGT 6225	Economic Decision Making	4
IE 6200	Engineering Probability and Statistics	4

Elective

Complete one of the following:		4
EMGT 5300	Engineering/Organizational Psychology	
EMGT 6305	Financial Management for Engineers	
OR 6205	Deterministic Operations Research	

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Technology Systems Mangement, Graduate Certificate

The Graduate Certificate in Technology Systems Management focuses on bridging the fields of technology, engineering, and business with a focus on the art and the science of managing organizational activities, including project and human resources engaged in engineering and technology development.

This four-course graduate certificate seeks to provide students with opportunities to apply technological knowledge and skills in a management setting to make data-driven, financial-based, and economic-based decisions.

Note: This certificate is for nonengineers and nongraduate engineering students. Graduate engineering students are not eligible for this graduate certificate.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

EMGT 5220	Engineering Project Management	4
EMGT 5300	Engineering/Organizational Psychology	4
EMGT 6225	Economic Decision Making	4
EMGT 6305	Financial Management for Engineers	4

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Engineering Economic Decision Making Graduate Certificate

The engineering economic decision-making graduate certificate program focuses on developing economic decision-making skills in the context of engineering operations and projects with attention to decision-making models, causes of risk and uncertainty, decisions under uncertainty, and ways to change and influence the degree of risk and uncertainty.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of engineering knowledge and skills in a management setting to build decision-making models and to make data-driven, financial-based, and economic-based decisions.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses

EMGT 6225	Economic Decision Making	4
EMGT 6305	Financial Management for Engineers	4

Electives

Complete two of the following:		8
IE 6200	Engineering Probability and Statistics	
OR 6205	Deterministic Operations Research	
OR 7250	Multi-Criteria Decision Making	

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Supply Chain Engineering Management, Graduate Certificate

The Graduate Certificate in Supply Chain focuses on acquiring and applying the knowledge and skills associated with designing, analyzing, managing, and improving supply chains within technology companies with attention on optimizing parts of a supply chain for effective and efficient functioning.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of engineering knowledge and skills to supply chains using deterministic and probabilistic decision-making models, lean concepts, mass customization principles, and methods of manufacturing including logistics, warehousing, and scheduling.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Courses

IE 5617	Lean Concepts and Applications	4
IE 7200	Supply Chain Engineering	4

Electives

Complete two of the following:		8
IE 5620	Mass Customization	
IE 6300	Manufacturing Methods and Processes	
OR 7310	Logistics, Warehousing, and Scheduling	

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

Lean Six Sigma Graduate Certificate

The Graduate Certificate in Lean Six Sigma focuses on enhancing engineering knowledge and skills with the fundamentals of lean manufacturing thinking and six sigma concepts to improve business processes through optimizing flow, eliminating waste, and emphasizing quality.

This four-course graduate certificate seeks to provide students with opportunities to apply the fundamentals of lean six sigma concepts across an enterprise to contribute to an organization's continuous improvement initiatives by identifying and employing lean and quality tools and techniques, along with utilizing statistical methods to achieve quality control.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

IE 5617	Lean Concepts and Applications	4
IE 6200	Engineering Probability and Statistics	4
IE 7280	Statistical Methods in Engineering	4
IE 7285	Statistical Quality Control	4

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

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

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 disciplines, as well as applied programs. Our cutting-edge and vibrant doctoral programs include industrial engineering and interdisciplinary PhD programs; while our master's degree programs consist of both master's degrees in industrial engineering and operations research. These extensive programs and concentrations allow for the selection of a degree that meets a wide variety of personal and professional goals.

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 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 (see table below). Students may pursue any master's 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 core courses	16 SH	16 SH	16 SH
Elective courses	16 SH	12 SH	8 SH
MEIE 6800	N/A	0 SH	0 SH
Technical Writing			
MEIE 6850	N/A	0 SH	0 SH
Research Seminar in Mechanical and Industrial Engineering			
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 master's degree in Industrial Engineering have the opportunity to also pursue one of 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Doctor of Philosophy Degree

The MIE department admits applicants to the PhD program in industrial engineering 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. 170)
- Industrial Engineering—Advanced Entry (p. 172)

Master of Science in Industrial Engineering (MSIE)

- Industrial Engineering (p. 175)

Graduate Certificate

- Data Mining Engineering (p. 177)

Industrial Engineering, PhD

Requirements

The 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., 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 co-advisor. Students are advised by the academic advisor of their discipline before they select their research advisor(s).

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 area exam) 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 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 area** exam equivalently referred to as **area exam**. This exam can be administered at any time after passing the written comprehensive exams but 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 (IND2), and Deterministic OR (IND3)

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 Area Examination

The objective of the oral exam, also referred to as **area exam**, is to assess a student's potential to perform independent research in the chosen field of specialization. This exam can be administered at any time after passing the written comprehensive exams but 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 area examination procedure: The student's research advisor convenes and chairs an oral examination committee comprised of a minimum of three faculty or affiliated faculty members of the MIE department deemed appropriate to the student's research field. This committee provides a set of technical papers pertinent to the student's research area. The oral examination committee will then conduct the area exam that comprises the following two parts (both completed in a one-hour session):

1. A thirty-minute oral presentation on a selected number of papers out of the assigned technical papers
2. A thirty-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 (GAC) 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 GAC will recommend one of the following three possible options:

1. *No invitation to oral area 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 area 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 area exam*

Grading Procedure and Results of the Oral Area Examination: If the student's performance in the oral area 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 coursework, 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 on their first attempt. 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 area 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 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 twelve months after successfully completing the oral exam, referred to as area exam. In addition, the presentation of the dissertation proposal and the actual dissertation defense (see below) shall be no less than six 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 area 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 at 1 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 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)**

(must be taken no later than the first time that it is offered after first two years of study)

- **Annual review**
- **Dissertation committee formation**

(no more than twelve months after successfully completing the oral area exam)

- **Dissertation proposal**

(must be presented no more than twelve months after successfully completing the oral area exam)

- **Dissertation defense**

(shall be no less than months from Dissertation proposal presentation)

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 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.

Dissertation Courses

Complete the following (repeatable) course twice:

ME 9990	Dissertation	0
Must register in two consecutive semesters (may include full summer term).		

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.00 GPA required

Industrial Engineering, PhD—Advanced Entry

Requirements

The 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., 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 co-advisor. Students are advised by the academic advisor of their discipline before they select their research advisor(s).

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 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 area exam) 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 important 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 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 area** exam also referred to as **area exam**. This exam can be administered at any time after passing the written comprehensive exams but no later than the end of the semester in which the written exams are taken and passed

Written Comprehensive Examinations

All doctoral students who hold a master's degree must take the written comprehensive exams no later than the first time that it is offered after their first academic year of study. The written comprehensive exams include **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 (IND2), and Deterministic OR (IND3)

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 Area Examination

The objective of the oral exam, also referred to as the **area exam**, is to assess a student's potential to perform independent research in the chosen field of specialization. This exam can be administered at any time after passing the written comprehensive exams but 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 Area Examination Procedure: The student's research advisor convenes and chairs an oral examination committee comprised of a minimum of three faculty or affiliated faculty members of the MIE department deemed appropriate to the student's research field. This committee provides a set of technical papers pertinent to the student's research area. The oral examination Committee will then conduct the area exam that comprises the following two parts (both completed in a one-hour session):

1. A thirty-minute oral presentation on a selected number of papers out of the assigned technical papers
2. A thirty-minute oral exam consisting of 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 (GAC) 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 GAC will recommend one of following three possible options:

1. *No invitation to oral area exam:* The student will be dismissed from the program. He or she may be granted 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 area 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 area exam*

Grading Procedure and Results of the Oral Area Examination: If the performance of the student in the oral area 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 the written and oral exams and any recommended course work 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 on their first attempt. 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 area 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 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, referred to as area exam. In addition, the presentation of the dissertation proposal and the actual dissertation defense (see below) shall be no less than six 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 area 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 at 1 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)**
(must be taken no later than the first time that it is offered after first year of study)
- **Annual review**
- **Dissertation committee formation**
(no more than twelve months after successfully completing the oral area exam)
- **Dissertation proposal**
(must be presented no more than twelve months after successfully completing the oral area exam)
- **Dissertation defense**
(shall be no less than six months from dissertation proposal presentation)

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 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:

ME 9990	Dissertation	0
---------	--------------	---

Must register in two consecutive semesters (may include full summer term).

Program Credit/GPA Requirements

24 total semester hours required

Minimum 3.00 GPA required

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 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.

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. Other students may choose to complete their degree by pursuing either a thesis, project, or course work option. Students who complete thesis option must make a presentation of their thesis before approval by the department.

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.

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 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 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 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 (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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)

- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Industrial Engineering with Graduate Certificate in Engineering Leadership

Students may complete a master's degree 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. 163)

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.

CERTIFICATE OPTION

Students completing this option will receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate required course work. (p. 162) 16

Course List

CSYE 6200	Concepts of Object-Oriented Design	4
CSYE 6205	Concepts of Object-Oriented Design with C++	4
CSYE 6210	Component Software Development	4
CSYE 6220	Enterprise Software Design	4
CSYE 7230	Software Engineering	4
CSYE 7270	Building Virtual Environments	4
CSYE 7280	User Experience Design and Testing	4
EMGT 5220	Engineering Project Management	4
EMGT 5300	Engineering/Organizational Psychology	4
EMGT 6225	Economic Decision Making	4
EMGT 6305	Financial Management for Engineers	4
IE 5617	Lean Concepts and Applications	4
IE 5620	Mass Customization	4
IE 5630	Biosensor and Human Behavior Measurement	4
IE 6300	Manufacturing Methods and Processes	4
IE 7255	Manufacturing Processes	4
IE 7270	Intelligent Manufacturing	4
IE 7275	Data Mining in Engineering	4
IE 7280	Statistical Methods in Engineering	4
IE 7285	Statistical Quality Control	4
IE 7290	Reliability Analysis and Risk Assessment	4
IE 7315	Human Factors Engineering	4
OR 7230	Probabilistic Operation Research	4
OR 7235	Inventory Theory	4
OR 7240	Integer and Nonlinear Optimization	4
OR 7245	Network Analysis and Advanced Optimization	4
OR 7250	Multi-Criteria Decision Making	4
OR 7260	Constraint Programming	4
OR 7310	Logistics, Warehousing, and Scheduling	4

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

Data Mining Engineering, Graduate Certificate

The data mining engineering graduate certificate program 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
IE 7275	Data Mining in Engineering
INFO 5100	Application Engineering and Development
INFO 6210	Data Management and Database Design
INFO 7390	Advances in Data Sciences and Architecture

Complete one of the following: 4

INFO 7290	Data Warehousing and Business Intelligence
EECE 5626	Image Processing and Pattern Recognition
EECE 7313	Pattern Recognition
IE 7280	Statistical Methods in Engineering

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Information Assurance

Website (<http://www.ccis.northeastern.edu/program/information-assurance-phd>)

202 West Village H

617.373.2462

Bryan Lackaye, Assistant Dean of Graduate Programs, College of Computer Science, phd-ia@lists.ccs.neu.edu

Please see the College of Computer and Information Sciences Information Assurance (p. 94) programs page for curriculum information.

The College of Computer and Information Science offers a Doctor of Philosophy in Information Assurance in conjunction with the College of Engineering and the College of Social Sciences and Humanities. The PhD in Information Assurance program is designed for both students with a strong background in a technical field and those with nontechnical backgrounds and a strong desire to pursue interdisciplinary work in areas

related to information assurance. Applicants are expected to have a minimum 3.000 undergraduate GPA.

Students who do not have the necessary technical background may be required to take prerequisite courses to prepare for the program.

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 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.

Students who enter the program with a master's degree will be required to complete 16 semester credit hours beyond the master's degree. They also must complete the required core courses.

Information Systems

Website (<http://www.coe.neu.edu/degrees/ms-is>)

Kal Bugrara, PhD

Program Director

130 Snell Engineering

617.373.4448

616.373.2501 (fax)

Kal Bugrara, PhD, Program Director, 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. In addition to the general requirements, the program offers multiple tracks (20 semester hours):

- Track 1: Web Engineering and Development
- Track 2: Data Architecture and Engineering
- Track 3: Application-Level Security Analysis and Engineering
- Track 4: Business Process Engineering
- Track 5: Software Project Planning and Management
- Track 6: Information Systems Auditing and Compliance
- Track 7: Enterprise Architecture and Governance
- Track 8: Engineering Clinical Information Systems

Graduate Certificate Options

Students enrolled in a master's degree in Information Systems have the opportunity to also pursue one of 14 engineering graduate certificate

options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Programs

Master of Science in Information Systems (MSIS)

- Information Systems (p. 178)

Information Systems, MSIS

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 progress through their course work in a cohort, taking two classes each fall and spring. Summer options will also be available at the discretion of the program director.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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. 163)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

All students must complete the following courses:

INFO 5100	Application Engineering and Development	4
INFO 5101	Lab for INFO 5100	

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 28 semester hours from the following subject areas:	28
INFO, CSYE (except CSYE 6220)	

SEATTLE CAMPUS COURSE WORK OPTION

CSYE 6225	Network Structures and Cloud Computing	4
INFO 6150	Web Design and User Experience Engineering	4
INFO 6205	Program Structure and Algorithms	4
INFO 6210	Data Management and Database Design	4
INFO 6250	Web Development Tools and Methods	4
INFO 6350	Smartphones-Based Web Development	4
INFO 7250	Engineering of Big-Data Systems	4

CERTIFICATE OPTION

Students completing this option will receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Required Course Work

Complete 16 semester hours of graduate certificate course work. (p. 162)	16
--	----

Electives

Complete 12 semester hours from the following subject areas: 12

INFO, CSYE (except CSYE 6220)

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

Interdisciplinary Engineering PhD Program

Website (<https://www.coe.neu.edu/degrees/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.

Mechanical 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

The Department of Mechanical and Industrial Engineering (MIE) offers comprehensive research and educational programs for both MS and PhD students in both traditional mechanical and industrial engineering disciplines, as well as applied programs. Our cutting-edge and vibrant doctoral programs include PhD in Mechanical Engineering and Interdisciplinary PhD; while our master's degree programs consist of 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.

Master of Science Degree

To be eligible for admission to any of the Master of Science (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 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	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 a master's degree in mechanical engineering with one of the following concentrations:

- General mechanical engineering
- Material science
- Mechanics and design
- Mechatronics

- Thermofluids

Graduate Certificate Options

Students enrolled in a master's degree in Mechanical Engineering have the opportunity to also pursue one of 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Doctor of Philosophy (PhD) 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)

- Mechanical Engineering (p. 180)
- Mechanical Engineering—Advanced Entry (p. 183)

Master of Science (MS)

- Data Analytics Engineering (p. 185)

Master of Science in Mechanical Engineering (MSME)

- Mechanical Engineering with Concentration in General Mechanical Engineering (p. 188)
- Mechanical Engineering with Concentration in Material Science (p. 191)
- Mechanical Engineering with Concentration in Mechanics (p. 190)
- Mechanical Engineering with Concentration in Mechatronics (p. 193)
- Mechanical Engineering with Concentration in Thermofluids (p. 195)

Mechanical Engineering, PhD

Requirements

The PhD is awarded to students who demonstrate high academic achievement and research competence in the fields of mechanical or industrial 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 co-advisor. Students are advised by the academic advisor of their discipline before they select their research advisor(s).

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 area 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 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 area** exam equivalently referred to as **area exam**. This exam can be administered at any time after passing the written comprehensive exams but 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. Written comprehensive exams include **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 mechanical 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)

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 AREA EXAMINATION

The objective of the oral exam, also referred to as the **area exam**, is to assess a student's potential to perform independent research in the chosen field of specialization. This exam can be administered at any time after passing the written comprehensive exams but 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 Area Examination Procedure: The student's research advisor convenes and chairs an oral examination committee comprised of a minimum of three faculty or affiliated faculty members of the MIE department deemed appropriate to the student's research field. This committee provides a set of technical papers pertinent to the student's research area. The oral examination committee will then conduct the area exam that comprises the following two parts (both to be completed in a one-hour session):

1. A thirty-minute oral presentation on a select number of papers out of the assigned technical papers
2. A thirty-minute oral exam consisting of 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 (GAC) 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 GAC will recommend one of the following three possible options:

1. *No invitation to oral area exam:* The student will be dismissed from the program. He or she may be granted an MS 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 area 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 area exam.*

Grading Procedure and Results of the Oral Area Examination: If a student's performance in the oral area exam is not satisfactory, the student will be dismissed from the program. He or she may be granted an MS 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 the written and oral exams and any recommended course work 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 on their first attempt. 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 area 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 twelve months after successfully completing the oral exam, referred to as area exam. In addition, the presentation of the dissertation proposal and the actual dissertation defense (see below) shall be no less than six 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 area 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 at 1 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)**

(must be taken no later than the first time that it is offered after first two years of study)
- **Annual review**
- **Dissertation committee formation**

(no more than twelve months after successfully completing the oral area exam)
- **Dissertation proposal**

(must be presented no more than twelve months after successfully completing the oral area exam)
- **Dissertation defense**

(shall be no less than six months from dissertation proposal presentation)

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 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.

Dissertation Courses

Complete the following (repeatable) course twice:

ME 9990	Dissertation	0
---------	--------------	---

Must register in two consecutive semesters (may include full summer term).

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 or industrial 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 co-advisor. Students are advised by the academic advisor of their discipline before they select their research advisor(s).

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 area 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 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 eExam A and exam B.
2. An **oral area** exam equivalently referred to as **area exam**. This exam can be administered at any time after passing the written comprehensive exams but no later than the end of the semester in which the written exams are taken and passed.

WRITTEN COMPREHENSIVE EXAMINATIONS

All doctoral students who hold a master's degree must take the written comprehensive exams no later than the first time that it is offered after their first academic year 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 the PhD degree program in mechanical 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 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)

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 AREA EXAMINATION

The objective of the oral exam, also referred to as the **area exam**, is to assess the student's potential to perform independent research in the chosen field of specialization. This exam can be administered at any time after passing the written comprehensive exams but 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 Area Examination Procedure: The student's research advisor convenes and chairs an oral examination committee comprised of a minimum of three faculty or affiliated faculty members of the MIE department deemed appropriate to the student's research field. This committee provides a set of technical papers pertinent to the student's research area. The oral examination committee will then conduct the area exam that comprises the following two parts (both to be completed in a one-hour session):

1. A thirty-minute oral presentation on a selected number of papers out of the assigned technical papers
2. aA thirty-minute oral exam consisting of 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 (GAC) 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 GAC will recommend one of the following three possible options:

1. *No invitation to oral area exam:* The student will be dismissed from the program. He or she may be granted an MS 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 area 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 area exam.*

Grading Procedure and Results of the Oral Area Examination: If the student's performance in oral area exam is not satisfactory, the student will be dismissed from the program. He or she may be granted an MS 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 the written and oral exams and any recommended course work 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 on their first attempt. 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 area 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 twelve months after successfully completing the oral exam, referred to as the area exam. In addition, the presentation of the dissertation proposal and the actual dissertation defense (see below) shall be no less than six 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 area 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)**

(must be taken no later than the first time that it is offered after first year of study)
- **Annual review**
- **Dissertation committee formation**

(no more than twelve months after successfully completing the oral area exam)
- **Dissertation proposal**

(must be presented no more than twelve months after successfully completing the oral area exam)
- **Dissertation defense**

(shall be no less than six months from dissertation proposal presentation)

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 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:

ME 9990	Dissertation	0
Must register in two consecutive semesters (may include full summer term).		

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Data Analytics Engineering, MS

Master of Science (MS) Degree in Data Analytics Engineering

The Department of Mechanical and Industrial Engineering (MIE) offers Master of Science (MS) 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 MS 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 GPA of 3.000. Students may pursue any master's program either on a full-time or part-time basis; however, certain restrictions may apply.

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. Other students may choose to complete their master's degree by pursuing a thesis, project, or course work option. Students who complete the thesis option must make a presentation of their thesis before approval by the department.

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, diagnostics, 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 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 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. Plan of Study 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 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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP**Master's Degree in Data Analytics Engineering with Graduate Certificate in Engineering Leadership**

Students may complete a master's degree 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 16 hours of advisor-approved Data Analytics technical courses.

Engineering Leadership (p. 163)

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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

COURSE LIST**Bouvé College of Health Sciences Electives**

HINF 5102	Data Management in Healthcare	3
HINF 6220	Database Design, Access, Modeling, and Security	3

College of Computer and Information Science Electives

CS 6140	Machine Learning	4
CS 6200	Information Retrieval	4
CS 6240	Parallel Data Processing in MapReduce	4
DS 6020		4
DS 6030		4
IA 5050	Data Mining in Cyberspace	4

College of Engineering Electives

CIVE 7100	Applied Time Series and Spatial Statistics	4
CSYE 7200	Big-Data System Engineering Using Scala	4
CSYE 7245	Big-Data Systems and Intelligence Analytics	4
CSYE 7270	Building Virtual Environments	4
EECE 5644	Introduction to Machine Learning and Pattern Recognition	4
EECE 7313	Pattern Recognition	4
EECE 7397	Advanced Machine Learning	4
EMGT 5220	Engineering Project Management	4
IE 5630	Biosensor and Human Behavior Measurement	4
IE 7270	Intelligent Manufacturing	4
IE 7615	Neural Networks in Engineering	4
INFO 7250	Engineering of Big-Data Systems	4
INFO 7290	Data Warehousing and Business Intelligence	4
OR 7245	Network Analysis and Advanced Optimization	4
OR 7250	Multi-Criteria Decision Making	4

College of Science Electives

MATH 7341	Probability 2	4
MATH 7342	Mathematical Statistics	4
MATH 7343	Applied Statistics	4
MATH 7344	Regression, ANOVA, and Design	4
PHYS 5116	Complex Networks and Applications	4
PHYS 7331	Network Science Data	4

College of Social Science and Humanities Electives

PPUA 5262	Big Data for Cities	3
PPUA 7237	Advanced Spatial Analysis of Urban Systems	3

D'Amore-McKim School of Business Electives

BUSN 6320	Business Analytics Fundamentals	1
BUSN 6324	Predictive Analytics for Managers	1

BUSN 6326	Introduction to Big Data and Digital Marketing Analytics	1
-----------	--	---

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.

Mechanical Engineering with Concentration in General Mechanical Engineering, MSME

Master of Science (MS) Degree in Mechanical Engineering with No Concentration (General Mechanical Engineering)

While pursuing a Master of Science Degree 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 Master of Science (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 coursework (exclusive of any preparatory courses) with a minimum GPA of 3.000. Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

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. Other students may choose to complete their degree by pursuing a thesis, project, or course work option. Students who complete thesis option must make a presentation of their thesis before approval by the department.

Special Course Requirements

All 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 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 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 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 (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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)

- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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. 163)

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

Or choose any material science (MATL) course.

Options

Complete one of the following options:

COURSE WORK OPTION

Complete 16 semester hours from 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 from 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 from the following subject areas: 8

ME, MATL, or other graduate engineering courses

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

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 piezoelectric 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 GPA of 3.000. Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

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. Other students may choose to complete their degree by pursuing a thesis, project, or course work option. Students who complete thesis option must make a presentation of their thesis before approval by the department.

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 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 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 coursework 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 coursework 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 coursework as well as helps the department to plan for requested course offerings. Plan of Study 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 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 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 (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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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’s degree 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. 163)

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 from 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 from 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 from the following subject areas:	8
ME, MATL, or other graduate engineering courses	

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master’s degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162)	16
--	----

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 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 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 bio-mimetics), 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 nano-composites/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 GPA of 3.000. Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

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. Other students may choose to complete a master's degree by pursuing a thesis, project, or course work option. Students who complete thesis option must make a presentation of their thesis before approval by the department.

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 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 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 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 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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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. 163)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Complete 16 semester hours from the following: 16

MATL	
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 from 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 from 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 from the following subject areas: 8

ME, MATL, or other graduate engineering courses

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

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 GPA of 3.000. Students may pursue any master's program either on a full-time or part-time basis; however, certain restrictions may apply.

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. Other students may choose to complete their master's degree by pursuing a thesis, project, or course work option. Students who complete thesis option must make a presentation of their thesis before approval by the department.

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 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 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 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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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 16 hours of advisor-approved Mechatronics technical courses.

Engineering Leadership (p. 163)

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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

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 Communications and Mixed-Signal Processing
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

32–36 total semester hours

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 GPA of 3.000. Students may pursue any program either on a full-time or part-time basis; however, certain restrictions may apply.

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. Other students may choose to complete their degree by pursuing a thesis, project, or course work option. Students who complete thesis option must make a presentation of their thesis before approval by the department.

SPECIAL COURSE REQUIREMENTS

All 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 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 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 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 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 (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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)

- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

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's degree 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 16 hours of advisor-approved Thermofluids technical courses.

Engineering Leadership (p. 163)

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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Program Credit/GPA Requirements

32-36 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

Operations Research

Website (<http://www.mie.neu.edu/degrees/master-science-operations-research>)

Hanchen Huang, PhD
Professor and Chair

Nader Jalili, PhD
Professor and Associate Chair for Graduate Studies and Research

Emanuel S. Melachrinoudis, PhD
Associate Professor, Associate Department Chair, and Director of Operations Research Graduate Program

334 Snell Engineering Center
617.373.2740
617.373.2921 (fax)
Tess Waggett, Business Manager, tess.waggett@northeastern.edu

The Department of Mechanical and Industrial Engineering (MIE) offers comprehensive research and educational programs for Master of Science (MS) students in operations research (OR). The field of OR deals with the application of scientific methods to decision making. Students have an opportunity to learn how to develop and solve mathematical and computer models of systems using optimization and statistical methods. OR graduates work in a wide variety of fields such as transportation, supply chain operations, communications and computer operations, manufacturing, finance, and healthcare. The OR program is offered jointly by MIE and the Department of Mathematics, thus achieving a unique balance of theory and application.

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 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 (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 core courses	16 SH	16 SH
Elective courses	16 SH	8 SH
MEIE 6800	N/A	0 SH
Technical Writing		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

Graduate Certificate Options

Students enrolled in a master's degree in Operations Research have the opportunity to also pursue one of 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Programs

Master of Science in Operations Research (MSOR)

- Operations Research (p. 198)

Operations Research, MSOR

The Department of Mechanical and Industrial Engineering (MIE) offers comprehensive research and educational programs for students pursuing Master of Science (MS) degrees 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 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. There are specific degree requirements for each of these tracks—see details (p. 199). Also, students can complete their master's degree either on a full-time or part-time basis; however, certain restrictions may apply.

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. Other students may choose to complete their degree by pursuing a thesis, project, or course work option. Students pursuing thesis option must make a presentation at a thesis defense before approval by the department.

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 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 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 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 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.

OR students must select all the required course work from the list found on the program requirements page (p. 199). 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 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 (OR 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 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.

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Operations Research with Graduate Certificate in Engineering Leadership

Students may complete a master's degree 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. 163)

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

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Complete 16 semester hours of graduate certificate course work. (p. 162) 16

Course List

CS 5800	Algorithms	4
CS 6140	Machine Learning	4
CS 7805	Theory of Computation	4
CSYE 6200	Concepts of Object-Oriented Design	4
CSYE 6205	Concepts of Object-Oriented Design with C++	4
CSYE 6210	Component Software Development	4
EECE 7313	Pattern Recognition	4
EECE 7360	Combinatorial Optimization	4
EMGT 5220	Engineering Project Management	4
EMGT 5300	Engineering/Organizational Psychology	4
EMGT 6225	Economic Decision Making	4
EMGT 6305	Financial Management for Engineers	4
IE 5400	Healthcare Systems Modeling and Analysis	4
IE 5500	Systems Engineering in Public Programs	4
IE 5617	Lean Concepts and Applications	4
IE 5620	Mass Customization	4
IE 5630	Biosensor and Human Behavior Measurement	4
IE 6300	Manufacturing Methods and Processes	4

IE 7200	Supply Chain Engineering	4
IE 7215	Simulation Analysis	4
IE 7275	Data Mining in Engineering	4
IE 7280	Statistical Methods in Engineering	4
IE 7285	Statistical Quality Control	4
IE 7290	Reliability Analysis and Risk Assessment	4
IE 7315	Human Factors Engineering	4
IE 7615	Neural Networks in Engineering	4
INFO 6205	Program Structure and Algorithms	4
INFO 6210	Data Management and Database Design	4
MATH 7232	Combinatorial Analysis	4
MATH 7233	Graph Theory	4
MATH 7342	Mathematical Statistics	4
MATH 7346	Time Series	4
MATH 7347	Statistical Decision Theory	4
MATH 7349	Stochastic Calculus and Introduction to No-Arbitrage Finance	4
OR 7235	Inventory Theory	4
OR 7240	Integer and Nonlinear Optimization	4
OR 7245	Network Analysis and Advanced Optimization	4
OR 7250	Multi-Criteria Decision Making	4
OR 7260	Constraint Programming	4
OR 7310	Logistics, Warehousing, and Scheduling	4

PROGRAM CREDIT/GPA REQUIREMENTS

32 total semester hours required
Minimum 3.000 GPA required

Sustainable Building Systems

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.

Fall	Hours	Spring	Hours
ARCH 5210	4	ARCH 5220 (or elective)	4
CIVE 7220 (or elective)	4	CIVE 5270 (or elective)	4
CIVE 7230 (or elective)	4	SBSY 5200	4
SBSY 5100	4	SBSY 5300 (or elective)	4
		16	16

Total Hours: 32

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.

Graduate Certificate Options

Students enrolled in a master's degree in Sustainable Building Systems have the opportunity to also pursue one of 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Graduate Certificate in Sustainable Energy Systems

The Sustainable Energy Systems Graduate Certificate (p. 161) program focuses on the integration of energy systems engineering technology with sustainable building systems including the design and operation of buildings with minimal energy and environment impact.

This four-course graduate certificate seeks to provide students opportunities to apply the fundamentals of engineering knowledge and skills to analyze energy systems as they relate to sustainable engineering building design with a focus on renewable energy with LEED certification or with a focus on industrial ecology including life cycle analysis and technical cost modeling. The program requires 16 semester hours of course work from your choice of courses—see details (p. 162).

Programs**Master of Science in Sustainable Building Systems (MSSBS)**

- Sustainable Building Systems (p. 200)

Graduate Certificate

- Sustainable Energy Systems (p. 161)

Sustainable Building Systems, MSSBS

The Master of Science in Sustainable Building Systems integrates elements of an architectural engineering program with construction management while embracing the concepts of engineering sustainability

as related to energy and materials usage and the effect on the environment.

Degree Requirements	Full-Time Study	Part-Time Study
Core courses	12	12
Restricted electives	8	8
Open elective	12	12

Graduate Certificate Options

Students who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Sustainable Building Systems with Graduate Certificate in Engineering Leadership

Students may complete a master's degree 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. 163)

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Course Work

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

Options

Complete one of the following options.

COURSE WORK OPTION

Open Electives

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	
ME 5645	Environmental Issues in Manufacturing and Product Use	

Restricted Electives

Complete 8 semester hours from the following:		8
ARCH 5220	Integrated Building Systems	
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
CIVE 7220	Construction Management	
CIVE 5221	Construction Project Control and Organization	
CIVE 7230	Legal Aspects of Civil Engineering	
CIVE 5231	Alternative Project Delivery Systems in Construction	
EMGT 6305	Financial Management for Engineers	
SBSY 5300	Information Systems for Integrated Project Delivery	

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Required Course Work

Complete 16 semester hours of graduate certificate course work. (p. 162)	16
--	----

Elective

Complete a minimum of 4 semester hours from the course lists above. 4

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

Telecommunications Systems Management

Website (<http://www.coe.neu.edu/degrees/ms-tsm>)

Peter O'Reilly, PhD

Program Director

130 Snell Engineering Center

617.373.2711

617.373.2501 (fax)

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.

Graduate Certificate Options

Students enrolled in a master's degree in Telecommunications Systems Management have the opportunity to also pursue one of 14 engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (p. 162).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering leadership program (p. 162) in combination with the MS degree.

Programs

Master of Science in Telecommunications Systems Management (MSTSM)

- Telecommunications Systems Management (p. 202)

Graduate Certificates

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

Telecommunications Systems Management, MSTSM

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 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.

The MSTSM degree has two options for completion; the Course Work Option and the Gordon Engineering Leadership Option:

DEGREE REQUIREMENTS FOR COURSE WORK OPTION

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 of the core courses, otherwise they will need to repeat the course. A maximum of two of the core courses may be waived if a student has taken similar course material at another university with a satisfactory grade or passes a competency test before the start of their first semester at Northeastern. 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 list of business electives is focused on engineering management and entrepreneurship. Electives come from an approved list of courses supplied by the colleges of engineering, business administration, 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 this list 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. Participants may elect Master's Project (TELE 6945) in place of one of the electives with approval of the program director.

All transfer credits must be approved by petition before course enrollment.

Independent Study (TELE 5978), usually for 1 or 2 semester hours, is sometimes available for students. Independent study must be carried out under the supervision of a professor and must have prior approval of the program director. Proposals for independent study 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. On 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 who are officially accepted into a graduate degree program in the College of Engineering may apply to pursue one of the following graduate engineering certificates in addition to the MS or PhD. Please visit the links below for additional information about each graduate engineering certificate program, related requirements, and how to apply.

Degree Requirements	Full-Time Study	Part-Time Study
Required core courses	12 SH	12 SH
Certificate courses	16 SH	16 SH
Technical elective	4 SH	4 SH
Minimum Semester Hours Required	32 SH	32 SH

Chemical Engineering

- Process Safety Engineering (p. 123)

Computer Systems Engineering

- Computer Systems Engineering (p. 139)

Energy Systems

- Energy Systems (p. 161)
- Renewable Energy (p. 160)
- Energy Systems Management (p. 161)
- Sustainable Energy Systems (p. 161)

Engineering Management

- Engineering Business (p. 167)
- Engineering Management (p. 167)
- Technology Systems Management (p. 168)
- Engineering Economic Decision Making (p. 168)
- Supply Chain Engineering Management (p. 168)
- Lean Six Sigma (p. 169)

Industrial Engineering

- Data Mining Engineering (p. 177)

Telecommunication Systems Management

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

GORDON INSTITUTE OF ENGINEERING LEADERSHIP Master's Degree in Telecommunications Systems Management with Graduate Certificate in Engineering Leadership

Students may complete a master's degree 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 will require 16 hours of advisor-approved Telecommunications Systems Management technical courses.

Engineering Leadership (p. 163)

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 5310	Fundamentals of Communication Systems	4
TELE 5320	Telecommunications Architecture and Systems	4
TELE 5330 and TELE 5331	Data Networking and Lab for TELE 5330	4

Options

Complete one of the following options:

COURSE WORK OPTION

Required

TELE 5340	Telecommunications Public Policy and Business Management	4
-----------	--	---

Electives

Complete a minimum of 16 semester hours from the course lists below (p. 203)	16
--	----

A grade of C or higher is required in each course.

At least one course must be taken from the business course list and at least one course from the technical course list.

CERTIFICATE OPTION

Students completing this option receive a Graduate Certificate in addition to the master's degree. Students should consult their faculty advisor regarding the certificate options.

Required Course Work

Complete 16 semester hours of graduate certificate course work. (p. 162)	16
--	----

Elective

Complete a minimum of 4 semester hours from the technical course list below.	4
--	---

BUSINESS COURSE LIST

EMGT 5220	Engineering Project Management	4
EMGT 6225	Economic Decision Making	4
EMGT 6305	Financial Management for Engineers	4
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
HRMG 6200	Managing People and Organizations	3

INFO 6245	Planning and Managing Information Systems Development	4
INFO 7260	Business Process Engineering	4
INFO 7285	Organizational Change and IT	4
INFO 7365	Enterprise Architecture Planning and Management	4
MGMT 6214	Negotiations	3
MGSC 6206	Management of Service and Manufacturing Operations	3
MKTG 6200	Creating and Sustaining Customer Markets	3
TECE 6222	Emerging and Disruptive Technologies	3
TECE 6230	Entrepreneurial Marketing and Selling	3
TECE 6240	Finance For Technology-Based Entrepreneurial Firms	3
TECE 6250	Lean Design and Development	3
TECE 6300	Managing a Technology-Based Business	3
TELE 6370	Perspectives in Telecommunications Policy	4
TELE 6380	Consulting Project in Telecommunications	4
TELE 6600	Special Topics—Telecommunication Policy	1-4
TELE 6602	Special Topics—Business	1-4

TECHNICAL COURSE LIST

CS 5520	Mobile Application Development	4
CS 5700	Fundamentals of Computer Networking	4
CS 6710	Wireless Network	4
CS 6740	Network Security	4
CS 6760	Privacy, Security, and Usability	4
CSYE 6200	Concepts of Object-Oriented Design	4
CSYE 6225	Network Structures and Cloud Computing	4
EECE 5576	Wireless Communication Systems	4
EECE 7364	Mobile and Wireless Networking	4
EECE 7374	Fundamentals of Computer Networks	4
IA 5150 and IA 5151	Network Security Practices and Lab for IA 5150	4
INFO 6210	Data Management and Database Design	4
INFO 6350	Smartphones-Based Web Development	4
TELE 5600	Linux/UNIX Systems Management for Network Engineers	4
TELE 6100	Mobile Wireless Communications and Networking	4
TELE 6200	Advanced Data Networking	4
TELE 6350	IP Telephony	4
TELE 6360	Operation Support Systems in Telecommunications	4
TELE 6601	Special Topics—Systems	1-4
TELE 6603	Special Topics—Networking	1-4

Program Credit/GPA Requirements

Minimum of 32 total semester hours required

Minimum 3.000 GPA required

Telecommunication Systems Management Graduate Certificates

- IP Telephony Systems (p. 204)
- Broadband Wireless Systems (p. 204)

Broadband Wireless Systems, Graduate Certificate

The broadband wireless systems graduate certificate program focuses on the fundamentals of wireless communications, IP networks and protocols, and telecommunications infrastructure as preparation for developing expertise in ongoing developments in mobile networking, broadband wireless communications, and mobile apps.

The four-course graduate certificate requires that three TSM core technical courses be taken along with a specified fourth course. With the approval of the certificate director, one of the core courses may be waived with another technical course taken in its place. Mobile Wireless Communications and Networking (TELE 6100) may not be waived under any circumstances.

Note: MS in Telecommunication Systems Management students are not eligible for this graduate certificate.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

TELE 5310	Fundamentals of Communication Systems	4
TELE 5320	Telecommunications Architecture and Systems	4
TELE 5330 and TELE 5331	Data Networking and Lab for TELE 5330	4
TELE 6100	Mobile Wireless Communications and Networking	4

Program Credit/GPA Requirements

16 total semester hours required
Minimum 3.000 GPA required

IP Telephony Systems, Graduate Certificate

The Graduate Certificate in IP Telephony Systems focuses on the fundamental knowledge in communications, IP networks and protocols, media transport, and signaling as preparation to developing expertise into ongoing developments in VoIP networks and services, the IP Multimedia Subsystem (IMS), unified communications, and video networks.

The four-course graduate certificate requires that three TSM core technical courses be taken along with a specified fourth course. With the approval of the certificate director, one of the core courses may be waived with another technical course taken in its place. IP Telephony (TELE 6350) may not be waived under any circumstance.

Note: MS in Telecommunication Systems Management students are not eligible for this graduate certificate.

Program Requirements**Requirements**

TELE 5310	Fundamentals of Communication Systems	4
TELE 5320	Telecommunications Architecture and Systems	4
TELE 5330 and TELE 5331	Data Networking and Lab for TELE 5330	4
TELE 6350	IP Telephony	4

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Bouvé College of Health Sciences

Website (<http://www.northeastern.edu/bouve/graduate>)

John R. Reynolds, PharmD, RPh, Interim Dean

Dean's Office
215 Behrakis Health Sciences Center
617.373.3323
617.373.3030 (fax)
Bouve_College_of_Health_Sciences@northeastern.edu

Jeanine Mount, PhD, RPh, Associate Dean for Academic Affairs

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, 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, Pharmacy (Pharmaceutical Sciences and PharmD), and the health professions (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 biotechnology, 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 (p. 206)
- Practicum/Internship Policies (p. 206)
- Background Checks (p. 207)
- Liability Insurance (p. 207)
- Grading (p. 207)
- Transfer of Credit (p. 207)
- Course Waiver (p. 207)
- Academic Progression (p. 208)
- Student's Academic Standing (p. 208)
- Academic Probation Policy (p. 208)

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 ten 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. 207)). 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 Graduate Office of Student Services 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
- Biotechnology: 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. This action plan must be signed by the advisor and the student and placed in the student's file in the graduate office within one month from the date of the written notification of probation. The student's failure to file an action plan may be cause for dismissal from the program. The action plan must specify the date by which the deficiency will be cleared. The Academic Probation Contract/Plan form will be sent to the student with the probationary letter, but it can be picked up in the Office of Graduate Student Services. Students will be placed on probation for the following deficiencies:

- A cumulative grade-point average (GPA) below 3.000. If the student remains on academic probation for two semesters, he or she may be terminated from the graduate program.
- In some programs, a grade of B– or below in a specified course.
- Unsatisfactory final grade in a clinical course, practicum, internship, or 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 during his or her entire 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.

Applied Psychology

Website (<http://www.northeastern.edu/bouve/ap>)

Karin Lifter, PhD

Professor and Chair

404 International Village
617.373.2485
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. 209)
- School Psychology (p. 210)

Certificate of Advanced Graduate Studies (CAGS)

- Applied Behavior Analysis (p. 211)
- Counseling Psychology (p. 212)
- School Psychology (p. 214)

Master of Science (MS)

- Applied Behavior Analysis (p. 212)
- College Student Development and Counseling (p. 213)
- School Psychology (p. 214)

Master of Science in Counseling Psychology (MSCP)

- Counseling Psychology (p. 213)

Graduate Certificate

- Applied Behavior Analysis (p. 215)
- Early Intervention (p. 215)

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:		3
CAEP 5200	Motivational Interviewing in a Healthcare Setting	
CAEP 7751	Advanced Clinical Neuropsychology	
CAEP 7723	Rorschach	
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		
CAEP 9990	Dissertation	0

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		
Complete 53 semester hours from the following (including course work, practicum, fieldwork, and internship):		
<i>Course Work</i>		
CAEP 6247	Child and Adolescent 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 6399	Clinical Skills in Counseling Psychology	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 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
<i>Practicum</i>		
CAEP 6400	Prepracticum in School Psychology	1
CAEP 8415	Practicum in School Psychology 1	2
CAEP 8416	Practicum in School Psychology 2	2
<i>Fieldwork</i>		
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
<i>Internship</i>		
CAEP 7798	Doctoral Internship 1	1-3
CAEP 7799	Doctoral Internship 2	2
Research Core		
<i>Research Course Work</i>		
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
<i>Research Teams</i>		
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 seeks to prepare graduates to assume supervisory behavior analyst roles in service agencies and in private and public school settings and to serve as independent consultants. Additionally, it seeks to give graduates expertise in a specific clinical area within applied behavior analysis. The six-course sequence that seeks to prepare students to take the BACB exam is followed by four additional courses in behavior analysis. These courses, which are related, explore the particular clinical issue in-depth.

Four standard programs of study are offered; students may take one or two courses each academic term and choose from a number of summer enrollment options. These options include taking one or two courses or not enrolling at all.

A representative program in which the student takes two courses during the academic year and one course in the summer follows. "Behavior Assessment" and "Research and Design Methods" must be taken first as they are prerequisites for enrolling in the remaining four courses. Specialization courses are indicated only generally; specific courses are determined by the area chosen.

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:

- Intake assessment
- Preference assessment
- Reinforcer assessment
- Functional analysis
- Antecedent intervention
- Consequence intervention
- Task analysis
- Discrimination training
- Literature review

Course assignments are designed to assist the student in designing and executing the projects associated with the skills and in preparing the documentation required for their inclusion in the Professional Portfolio.

A faculty member reviews and signs each project in the Professional Portfolio. The signature indicates that the student has achieved the faculty-established standards for the project. Graduates are encouraged to use their Professional Portfolios when applying for employment.

Although a thesis is not required for graduation from either the Master of Science or CAGS program in Applied Behavior Analysis, students interested in research may combine two or three of the Professional Portfolio items into a research project. For example, the student may complete a literature search on stereotypical behavior, then conduct a functional analysis and intervention with a participant who exhibits that behavior. The research project is then prepared in journal format for inclusion in the Professional Portfolio.

Projects may be submitted for inclusion in the Professional Portfolio at any time during the graduate program. When the student has completed all Professional Portfolio requirements, the program director should be notified so that a final review may take place. A complete Professional Portfolio is required for graduation.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Professional Portfolio

- Preference assessment
- Reinforcer assessment
- Functional analysis
- Task analysis
- Antecedent intervention
- Consequence intervention
- Discrimination training
- 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 6332	Advanced Learning Seminar 2	3
CAEP 6335	Applied Programming Seminar 2	3
CAEP 6324	Programmed Learning	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 that does not meet licensed mental health counselor (LMHC) licensure requirements in Massachusetts. It is a 30-semester-hour course of study—including eight didactic courses and two internship courses, which include 600 hours of supervised clinical experience in a mental health setting. Students who have not completed a formal practicum placement also will be required to do a 150-hour practicum placement. This program is individually tailored to fulfill a student's professional and licensing goals.

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

Complete 24 semester hours of core courses to be chosen in consultation with your faculty advisor.	24
--	----

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 seeks to prepare graduates to assume supervisory behavior analyst roles in service agencies and in private and public school settings and to serve as independent consultants. The six-course sequence that seeks to prepare students to take the Behavior Analysis Certification Board (BACB) exam is followed by four additional courses in behavior analysis. These courses explore the principles and procedures of applied behavior analysis in more depth and address its philosophical underpinnings.

Four standard programs of study are offered; students may take one or two courses each academic term and choose from a number of summer enrollment options. These options include taking one or two courses or not enrolling at all.

A representative program in which the student takes two courses during the academic year and one course in the summer follows. "Behavior Assessment" and "Research and Design Methods" must be taken first as they are prerequisites for enrolling in the remaining four courses. Similarly, CAEP 6336, Systematic Inquiry 1 must be taken before CAEP 6337, Systematic Inquiry 2.

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:

- Intake assessment
- Preference assessment
- Reinforcer assessment
- Functional analysis
- Antecedent intervention
- Consequence intervention
- Task analysis
- Discrimination training
- Literature review

Course assignments are designed to assist the student in designing and executing the projects associated with the skills and in preparing the documentation required for their inclusion in the Professional Portfolio.

A faculty member reviews and signs each project in the Professional Portfolio. The signature indicates that student has achieved the faculty-established standards for the project. Graduates are encouraged to use their Professional Portfolios when applying for employment.

Although a thesis is not required for graduation from either the Master of Science or Certificate of Advanced Graduate Studies (CAGS) program in ABA, students interested in research may combine two or three of the Professional Portfolio items into a research project. For example, the student may complete a literature search on stereotypical behavior, then conduct a functional analysis and intervention with a participant who exhibits that behavior. The research project is then prepared in journal format for inclusion in the Professional Portfolio.

Projects may be submitted for inclusion in the Professional Portfolio at anytime during the graduate program. When the student has completed all Professional Portfolio requirements, the program director should be notified so that a final review may take place. A complete Professional Portfolio is required for graduation.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Professional Portfolio

Intake assessment
Preference assessment
Reinforcer assessment
Functional analysis
Task analysis
Antecedent intervention
Consequence intervention
Discrimination training
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. 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 development, value diversity, and complement the academic experience of college students.

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 6305	Special Topics in Higher Education	3
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 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 6300	Introduction to College Student Development	3

CAEP 6230	Health Issues in Counseling	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 6262	Evaluation and Outcomes Assessment of Community, School, and Health-Related Programs	3
CAEP 6202	Research, Evaluation, and Data Analysis	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

<i>Course Work</i>		
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
<i>Seminar</i>		
CAEP 6380	Seminar in Feminist Psychology	3
<i>Research</i>		

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 Adolescent 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 6203	Understanding Culture and Diversity	3
CAEP 6206	Learning Principles	3
CAEP 6218	Infant, Child, and Adolescent Development	3
CAEP 6247	Child and Adolescent Psychopathology	3
CAEP 7750	Biological Bases of Behavior	3
CAEP 6365	Seminar in School Psychology	3

MS Options

Complete one of the following options:

OPTION WITHOUT SPECIALIZATION

CAEP 6202	Research, Evaluation, and Data Analysis	3
-----------	---	---

APPLIED BEHAVIOR ANALYSIS OPTION

CAEP 6327	Behavior Assessment	3
CAEP 6328	Research and Design Methods	3

EARLY INTERVENTION OPTION

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 Program Credit/GPA Requirements

31 total semester hours required

Minimum 3.000 GPA required

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

CAGS Optional Specializations

Note: A specialization is optional. Consult your faculty advisor for more information.

EARLY INTERVENTION SPECIALIZATION APPLIED BEHAVIOR ANALYSIS SPECIALIZATION

CAEP 6336	Systematic Inquiry 1	3
CAEP 6329	Service Administration	3
CAEP 8417	Intensive Practicum in Applied Behavior Analysis 1	2
CAEP 8418	Intensive Practicum in Applied Behavior Analysis 2	2

CAGS Program Credit/GPA Requirements

31 total semester hours required
Minimum 3.000 GPA required

Applied Behavior Analysis, Graduate Certificate

The Graduate Certificate in Applied Behavior Analysis program seeks to provide students with the knowledge base necessary for eligibility to take the Behavior Analysis Certification Board (BACB) exam. The curriculum, which is based on the BACB Fourth Edition Task List, includes six courses, all of which are offered online. Four standard programs of study are available; students may take one or two courses each term and may elect not to enroll at all during the summer, regardless of course load chosen. Special programs of study may also be arranged.

A representative program in which students take two courses during the academic year and the summer off follows. Behavior Assessment (CAEP 6327) and Research and Design Methods (CAEP 6328) are taken first as they are prerequisites for enrolling in the remaining four courses.

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, MS in Speech-Language Pathology, MS in Counseling Psychology).

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

503 Behrakis Health Sciences Center

617.373.7577

617.373.2239 (fax)

Lori Book, SLP Program Director, l.book@northeastern.edu

Doctor of Audiology Program

503 Behrakis Health Sciences Center

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

Doctor of Audiology (AuD)

- Doctor of Audiology (p. 216)

Master of Science (MS)

- Speech-Language Pathology (p. 217)

Audiology, AuD

Audiologists specialize in the prevention, identification, assessment, and rehabilitation of hearing and balance disorders and serve those with congenital and acquired hearing losses. They prescribe and dispense hearing aids and instruct patients in using amplification and

provide aural rehabilitation and speech reading services to those with hearing aids or cochlear implants. Additionally, audiologists provide vestibular rehabilitation or balance retraining exercises for some balance disorders. Upon graduation, students are employed in a variety of settings that reflect the diverse populations served by audiologists. Some graduates are self-employed in private practice clinics that provide speech, language, and hearing services. Others function as members of interdisciplinary teams in healthcare settings or educational settings or in research laboratories.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

A grade of B or higher is required in each course.

Diagnostic

SLPA 5100	Diagnostic Audiometry	3
SLPA 5104	Differential Diagnosis in Audiology	3
SLPA 5105	Auditory Pathologies	3
SLPA 5110	Language Disorders across the Life Span (or elective)	3-4
SLPA 6722	Evaluation and Treatment of Central Pathologies	3
SLPA 6728	Assessment of Vestibular Disorders	3
SLPA 6737	Advanced Evoked Potential Measures	3

Physiology

SLPA 5109	Neurology of Communication	3
SLPA 5111	Anatomy and Physiology of the Auditory System	3
SLPA 6741	Pharmacology for Audiologists	2

Treatment

SLPA 5108	Rehabilitation Audiology	3
SLPA 6210	Psychosocial Aspects of Communication Disorders	2
SLPA 6715	Amplification 1	3
SLPA 6716	Amplification 2	3
SLPA 6729	Management of Vestibular Disorders	3
SLPA 6747	Implantable Hearing Devices	3

Practice

SLPA 6211	Research and Evidence-Based Practice	3
SLPA 6215	Pediatric Audiology	3
SLPA 6314	Professional Practice	2
SLPA 6420	Practical Statistics for Speech-Language Pathology and Audiology	3
SLPA 6711	Scope of Practice in Audiology	2
SLPA 6773	Topics Seminar	3

Hearing Science

SLPA 6217	Noise and Hearing	3
SLPA 6221	Hearing Science	3
SLPA 6224	Psychoacoustics and Electroacoustics	3

Elective

Complete one elective course.	3
-------------------------------	---

Clinic and Internship

A grade of B or higher is required in each course.

Clinic		
SLPA 6751	Advanced Audiology Clinic 1	2
SLPA 6752	Advanced Audiology Clinic 2	2
SLPA 6753	Advanced Audiology Clinic 3	2
SLPA 6754	Advanced Audiology Clinic 4	2
SLPA 6755	Advanced Audiology Clinic 5	2
SLPA 6756	Advanced Audiology Clinic 6	2
SLPA 6757	Advanced Audiology Clinic 7	3
SLPA 6758	Advanced Audiology Clinic 8	3
Internship		
SLPA 6791	AuD Clinic Internship 1	3
SLPA 6792	AuD Clinic Internship 2	3
SLPA 6793	AuD Clinic Internship 3	3

Program Credit/GPA Requirements

101 total semester hours required
Minimum 3.000 GPA required

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>)

Carmen Castaneda Sceppa, MD, PhD

Professor and Chair of Health Sciences

316 Robinson Hall
617.373.5443
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 an engaging undergraduate academic program in health sciences as well as graduate degree programs, including the Master of Public Health, focusing in urban health, and Master of Science in Exercise Science with Concentration in Physical Activity and Public Health.

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. 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 (IUHR), the Center for Community Health Education Research and Service (CCHERS), and our National Institutes of Health- (NIH) funded Center for Population Health and Health Disparities (CPHHD), as well as community agencies and neighborhood health centers in the local Boston area.

Certificates in Health Informatics

Northeastern's graduate certificate programs provide high-quality, specialized training in health informatics and the opportunity to acquire and apply your knowledge quickly. In eight months, you can prepare for a key role in areas of the field offering ample career opportunities.

Three certificate programs enable you to choose the one that addresses your specific goals:

- 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.

Programs

Doctor of Philosophy (PhD)

- Population Health (p. 218)

Master of Science (MS)

- Exercise Science with Concentration in Physical Activity and Public Health (p. 220)
- Health Informatics (p. 221)

Master of Public Health (MPH)

- Master of Public Health (p. 219)
- Health Data Analytics (p. 92)

Graduate Certificates

- Health Informatics Management and Exchange (p. 222)
- Health Informatics Privacy and Security (p. 222)
- Health Informatics Software Engineering (p. 222)

Dual Degree

- Pharmacy and Public Health, PharmD/MPH (p. 221)

Population Health, PhD

Helen H. Suh, ScD

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	Epidemiology	3,4
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
Complete 5 semester hours from the elective list below.		5

HEALTH SERVICES AND POLICY OPTION

ECON 5110	Microeconomic Theory	4
PHTH 5234	Economic Perspectives on Health Policy	3
Complete 4 semester hours from the elective list below.		4

Electives

CIVE 7388	Special Topics in Civil Engineering	2,4
ECON 5110	Microeconomic Theory	4
ECON 5140	Applied Econometrics	4
ECON 7200	Topics in Applied Economics	4
EXSC 5200	Cardiopulmonary Physiology	3
EXSC 5220	Advanced Exercise Physiology	3

EXSC 5230	Physical Activity and Exercise: Effects on Musculoskeletal Health and Disease	3
HINF 5200	Theoretical Foundations in Personal Health Informatics	4
HRMG 6220	Health Organization Management	3
PHSC 6216	Human Physiology and Pathophysiology	2
PHTH 5212	Public Health Administration and Policy	3
PHTH 5214	Environmental Health	3
PHTH 5226	Strategic Management and Leadership in Healthcare	3
PHTH 5228	Advances in Measuring Behavior	3
PHTH 5230	Global Health	3
PHTH 5440	Community-Based Participatory Research: Environmental Health	3
PHTH 5540	Health Education and Program Planning	3,4
PHTH 6200	Principles and History of Urban Health	3
PHTH 6204	Society, Behavior, and Health	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 6232	Neighborhood and Public Health	3
PHTH 6320	Qualitative Methods in Health and Illness	3
SOCL 7257	Contemporary Issues in Sociology	3
SOCL 7287	Social Movements in Health	3
STRT 6220	Strategic Management for Healthcare Organizations	3

Dissertation Courses

Complete the following (repeatable) course twice:

PHTH 9990	Dissertation	0
-----------	--------------	---

Program Credit/GPA Requirements

33 total semester hours required
 Minimum 3.000 GPA required

Public Health, MPH

Shan Mohammed, MD, MPH

Program Director

The Master of Public Health program at Northeastern University seeks to provide society with knowledgeable, professionally educated, racially and ethnically diverse individuals who promote and protect the health of urban communities through innovation in practice-oriented education, research, and service.

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	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 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 6400	Principles of Population Health 1
PHTH 6410	Principles of Population Health 2
PHTH 6440	Advanced Methods in Biostatistics
PPUA 6509	Techniques of Program Evaluation
PHTH 6800	Causal Inference in Public Health Research

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

Chair: Carmen Castaneda Sceppa, MD, PhD
Director: Professor Rui Li, PhD

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	3

Public Health Core

PHTH 5540	Health Education and Program Planning	3
PHTH 6208	Urban Community Health Assessment	3

Research Core

PHTH 5202	Epidemiology	3
PHTH 5210	Biostatistics in Public Health	3
EXSC 6400	Applied Research Methods	3

Electives¹

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 a 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 MS 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 MS in Health Data Analytics consists of twelve 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

HINF 6400	Introduction to Health Data Analytics	3
DS 6020		4
DS 6030		4
PPUA 6301	Introduction to Computational Statistics	4
PPUA 6302	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
<i>Thesis</i>		
HINF XXXX	Health Data Analytics Thesis ¹	
<i>Capstone</i>		
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. 93) 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	3
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 5210	Biostatistics in Public Health	3
PHTH 6204	Society, Behavior, and Health	3
PHTH 6200	Principles and History of Urban Health	3
PHTH 6966	Practicum	1-4
PHTH 5202	Epidemiology	3,4
PHTH 5212	Public Health Administration and Policy	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 5214	Environmental Health	3
PHTH 5120	Race, Ethnicity, and Health in the United States	3
PHTH 6901	Capstone 1	1
PHTH 6902	Capstone 2	2

Electives

Complete 9 semester hours from the following subject area:	9
PHTH	

Program Credit/GPA Requirements

156 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. 253), for curriculum information.

Health Informatics Privacy and Security, Graduate Certificate

See Bouvé College of Health Sciences interdisciplinary programs (p. 253) for curriculum information.

Health Informatics Software Engineering Graduate Certificate

See Bouvé College of Health Sciences interdisciplinary programs (p. 253) 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 the newly enacted healthcare legislation passed by Congress, 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 ten 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. 223)
- Nursing—Advanced Entry (p. 224)

Doctor of Nursing Practice (DNP)

- Doctor of Nursing Practice (p. 224)
- Doctor of Nursing Practice with Concentration in Nurse Anesthesia (p. 225)

Certificate of Advanced Graduate Study (CAGS)

- Adult-Gerontology Nurse Practitioner, Acute Care (p. 225)
- Family Psychiatric Nurse Practitioner (p. 226)
- Neonatal Nurse Practitioner (p. 226)
- Nurse Anesthesia (p. 227)
- Pediatric Nurse Practitioner, Acute Care (p. 227)
- Pediatric Nurse Practitioner, Acute and Primary Care (p. 227)
- Pediatric Nurse Practitioner, Primary Care (p. 228)
- Adult-Gerontology Nurse Practitioner, Primary Care (p. 226)

Master of Science (MS)

- Nursing—Adult-Gerontology Nurse Practitioner, Acute Care (p. 228)
- Nursing—Family Psychiatric Nurse Practitioner (p. 229)
- Nursing—Neonatal Nurse Practitioner (p. 230)
- Nursing—Pediatric Nurse Practitioner, Acute and Primary Care (p. 230)
- Nursing—Pediatric Nurse Practitioner, Primary Care (p. 231)
- Nursing—Adult-Gerontology Nurse Practitioner, Primary Care (p. 229)
- Nursing—Family Nurse Practitioner, Primary Care (p. 230)
- Nursing—Direct Entry (p. 231)
- Nursing Administration (p. 232)
- Nursing Anesthesia (p. 232)

Dual Degree

- Nursing and Business Administration, MS/MBA (p. 233)

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

NRSRG 7104	Foundations in Nursing Research	3
NRSRG 7700	The Science of Nursing	3
NRSRG 7705	Theoretical and Conceptual Foundations in Nursing Science	3
NRSRG 7709	Qualitative Research Methods	3
NRSRG 7712	Quantitative Research Methods	3
NRSRG 7715	Measurement in Clinical Research	3
NRSRG 7750	Healthcare of Urban Populations	3
NRSRG 7770	Research Colloquium (repeatable)	1
NRSRG 7755	Intervention Research: Development, Implementation, and Evaluation	3

Statistics

PHTH 5210	Biostatistics in Public Health	3
NRSRG 5121	Epidemiology and Population Health	3
PHTH 6210	Applied Regression Analysis	3

Research Practicum

NRSRG 9984	Research (repeatable)	1-4
------------	-----------------------	-----

Cognate Courses¹

Complete two cognate courses in consultation with your faculty advisor.	6
---	---

Electives²

Complete two elective courses in consultation with your faculty advisor.	6
--	---

Dissertation

NRSRG 9845	Dissertation Seminar 1	3
NRSRG 9846	Dissertation Seminar 2	3
NRSRG 9990	Dissertation (take twice, for a total of 2 semester hours)	1

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 (repeatable course)	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

NRSG 9984	Research (repeatable course, to be taken twice)	1-4
-----------	---	-----

Dissertation Courses

NRSG 9845	Dissertation Seminar 1	3
NRSG 9846	Dissertation Seminar 2	3
NRSG 9990	Dissertation (repeatable course, to be taken twice)	1

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, research translation, 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 other 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.

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 5121	Epidemiology and Population Health	3
NRSG 6300	Healthcare Finance and Marketing	3
NRSG 6302	Health Policy and Law	3
NRSG 6306	Health Informatics	3
NRSG 7100	Leadership in Advanced Practice Nursing	3

Capstone Courses

NRSNG 7920	The Steps to Practice Inquiry: Analyze, Evaluate, Synthesize, and Apply the Evidence	3
NRSNG 7921	DNP Scholarly Project 1: Design and Ethical Consideration of Practice Application	3
NRSNG 7922	DNP Scholarly Project 2: Applying Practice Knowledge—Implementation/Outcomes	3
NRSNG 7923	DNP Scholarly Project 3: Dissemination of Practice Inquiry	3

Elective

Complete 3 semester hours from the following subject area:	3
NRSNG: Graduate level, selected with consultation with faculty advisor	

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

NRSNG 5127	Scientific Inquiry and Epidemiological Concepts	3
NRSNG 5170	Statistics in Nursing	2
NRSNG 5182	Physical Examination and Differential Diagnosis	4
NRSNG 5184	Biochemistry for Nurse Anesthesia	4
NRSNG 6372	Professional Aspects of Nurse Anesthesia Practice	3
NRSNG 7100	Leadership in Advanced Practice Nursing	3
NRSNG 7105	Translating Research Evidence into Practice	3

Pharmacology for Nurse Anesthesia

NRSNG 6369	Pharmacology for Nurse Anesthesia 1	5
NRSNG 6371	Pharmacology for Nurse Anesthesia 2	4

Anatomy and Physiology

NRSNG 5172	Clinical Anatomy and Physiology 1 for Nurse Anesthesia	6
NRSNG 5174	Clinical Anatomy and Physiology 2 for Nurse Anesthesia	5

Healthcare

NRSNG 6302	Health Policy and Law	3
NRSNG 6306	Health Informatics	3
NRSNG 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

NRSNG 6375	Fundamentals of Nurse Anesthesia Practice 1	9
NRSNG 6379	Fundamentals of Nurse Anesthesia Practice 2	9

Clinical Practicum

NRSNG 7400	Nurse Anesthesia Clinical Practicum 1	5
NRSNG 7403	Nurse Anesthesia Clinical Practicum 2	5
NRSNG 7406	Nurse Anesthesia Clinical Practicum 3	5
NRSNG 7409	Nurse Anesthesia Clinical Practicum 4	5

Role Development

NRSNG 7412	Nurse Anesthesia Role Development 1	6
NRSNG 7415	Nurse Anesthesia Role Development 2	6
NRSNG 7418	Nurse Anesthesia Role Development 3	6
NRSNG 7421	Nurse Anesthesia Role Development 4	6

Capstone

NRSNG 7921	DNP Scholarly Project 1: Design and Ethical Consideration of Practice Application	3
NRSNG 7922	DNP Scholarly Project 2: Applying Practice Knowledge—Implementation/Outcomes	3
NRSNG 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

NRSNG 6220	Nursing Management: Acute Episodic Illness	3
NRSNG 6221	Nursing Management: Critical and Chronic Illness	3
NRSNG 6241	Acute-Care Concepts in Nursing Practice	3

Acute-Care Practicum

NRSNG 6420	Adult-Gerontology Acute-Care Nursing Practicum 1	2
NRSNG 6421	Adult-Gerontology Acute-Care Nursing Practicum 2	4
NRSNG 6422	Adult-Gerontology Acute-Care Nursing Practicum 3	4

Electives

Complete 5 semester hours from the following subject area:	5
NRSNG	

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

NRSNG 6249	Health Promotion of Adult/Older Adult	3
NRSNG 6253	Primary Care of Adult/Older Adult Health Problems	4
NRSNG 6254	Primary Care of Adult/Older Adult Complex Patients	4

Clinical Core

NRSNG 5117	Advanced Pharmacology	2
NRSNG 5126	Pathophysiology for Advanced Practice	3
NRSNG 6115	Health Assessment	3
NRSNG 6222	Pharmacology of Adults and Older Adults	2

Adult-Gerontology Nurse Practicum

NRSNG 6449	Health Promotion of Adult/Older Adult Practicum	1
NRSNG 6450	Adult/Older Adult Practicum 1	4
NRSNG 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

NRSNG 6281	Dimensions of Clinical Practice	3
NRSNG 6282	Clinical Psychopharmacology	3
NRSNG 6283	Psychobiological Bases of Mental Disorders	3
NRSNG 6286	Contemporary Psychotherapies—Theory and Practice	3

Family Psychiatric Practicum

NRSNG 6480	Psychiatric Practicum across the Life Span 1	5
NRSNG 6481	Psychiatric Practicum across the Life Span 2	5

Elective

Complete 2 semester hours from the following subject area:	2
NRSNG	

Program Credit/GPA Requirements

24 total semester hours required
Minimum 3.000 GPA required

Nursing—Neonatal Nurse Practitioner, CAGS

We also 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. One year of full-time study offers you an opportunity to increase your skills and experience and enable you 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

NRSNG 5117	Advanced Pharmacology	2
NRSNG 5126	Pathophysiology for Advanced Practice	3

Requirements

A grade of B or higher is required in all course work.

Clinical Core

NRSNG 6116	Advanced Health Assessment of the Neonate and Infant	3
NRSNG 6230	Nursing Management: Critically Ill Neonatal 1	3
NRSNG 6231	Nursing Management: Critically Ill Neonatal 2	3
NRSNG 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)		
Please choose courses in consultation with faculty advisor.		
NRSG		3

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

CAEP 5151	Early Intervention: Infant and Toddler Development, Risk, and Disability	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: NRSG	3
--	---

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

CAEP 5151	Early Intervention: Infant and Toddler Development, Risk, and Disability	3
NRSG 5117	Advanced Pharmacology	2
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 6275	Urban Families at Risk: A Primary Care Approach	4
NRSG 6264	Care of Well Child/Adolescent Health Promotion	4
NRSG 6265	Care of Child/Adolescent Health Problems	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 from 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

NRSRG 5118	Healthcare System and Professional Role Development	3
NRSRG 5121	Epidemiology and Population Health	3

Primary Adult-Gerontology Nurse Core

NRSRG 6249	Health Promotion of Adult/Older Adult	3
NRSRG 6253	Primary Care of Adult/Older Adult Health Problems	4
NRSRG 6254	Primary Care of Adult/Older Adult Complex Patients	4

Clinical Core

NRSRG 5117	Advanced Pharmacology	2
NRSRG 5126	Pathophysiology for Advanced Practice	3
NRSRG 6115	Health Assessment	3
NRSRG 6222	Pharmacology of Adults and Older Adults	2

Adult-Gerontology Nurse Practicum

NRSRG 6449	Health Promotion of Adult/Older Adult Practicum	1
NRSRG 6450	Adult/Older Adult Practicum 1	4
NRSRG 6451	Adult/Older Adult Practicum 2	4

Research Core

NRSRG 7105	Translating Research Evidence into Practice	3
NRSRG 7110	Evidence-Based Practice Research Application	2

Elective

Complete 2 semester hours from the following subject area:	2
NRSRG	

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 nurses with a diploma or associate degree from a nursing program, there is a 67-semester-hour BSN/MSN option.
- 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

NRSRG 5118	Healthcare System and Professional Role Development	3
NRSRG 5121	Epidemiology and Population Health	3

Family Psychiatric Core

NRSRG 6281	Dimensions of Clinical Practice	3
NRSRG 6282	Clinical Psychopharmacology	3
NRSRG 6283	Psychobiological Bases of Mental Disorders	3
NRSRG 6286	Contemporary Psychotherapies—Theory and Practice	3

Clinical Core

NRSRG 5117	Advanced Pharmacology	2
NRSRG 5126	Pathophysiology for Advanced Practice	3
NRSRG 6115	Health Assessment	3

Family Psychiatric Practicum

NRSRG 6480	Psychiatric Practicum across the Life Span 1	5
NRSRG 6481	Psychiatric Practicum across the Life Span 2	5

Research Core

NRSRG 7105	Translating Research Evidence into Practice	3
NRSRG 7110	Evidence-Based Practice Research Application	2

Elective

Complete 2 semester hours from the following subject area:	2
NRSRG	

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

We require applicants to have at least two years of neonatal intensive care unit (NICU) experience before entering our program, and most have more than that. As a registered nurse, you already have a significant base of nursing knowledge. The neonatal nurse practitioner (NNP) program

focuses on advanced nursing knowledge and clinical practice. You will have an opportunity to:

- 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 5118	Healthcare System and Professional Role Development	3
NRSG 5121	Epidemiology and Population Health	3
NRSG 5126	Pathophysiology for Advanced Practice	3
NRSG 5117	Advanced Pharmacology	2

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: NRSG	4
-----------------	--	---

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

NRSNG 5118	Healthcare System and Professional Role Development	3
NRSNG 5121	Epidemiology and Population Health	3

Acute and Primary Care Core

CAEP 5151	Early Intervention: Infant and Toddler Development, Risk, and Disability	3
NRSNG 6275	Urban Families at Risk: A Primary Care Approach	4
NRSNG 6264	Care of Well Child/Adolescent Health Promotion	4
NRSNG 6267	Care of the Critically Ill Child	4
NRSNG 6265	Care of Child/Adolescent Health Problems	4

Clinical Core

NRSNG 5117	Advanced Pharmacology	2
NRSNG 5126	Pathophysiology for Advanced Practice	3
NRSNG 6115	Health Assessment	3
NRSNG 6262	Pediatric Pharmacology	2

Acute and Primary Care Practicum

NRSNG 6460	Care of Well Child/Adolescent Health Promotion Practicum	4
NRSNG 6461	Child/Adolescent Health Problems Practicum	4
NRSNG 6463	Care of the Critically Ill Child Practicum	4

Research Core

NRSNG 7105	Translating Research Evidence into Practice	3
NRSNG 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

NRSNG 5118	Healthcare System and Professional Role Development	3
NRSNG 5121	Epidemiology and Population Health	3

Pediatric Primary Care Core

NRSNG 6275	Urban Families at Risk: A Primary Care Approach	4
NRSNG 6264	Care of Well Child/Adolescent Health Promotion	4
NRSNG 6265	Care of Child/Adolescent Health Problems	4

Clinical Core

NRSNG 5117	Advanced Pharmacology	2
NRSNG 5126	Pathophysiology for Advanced Practice	3
NRSNG 6115	Health Assessment	3
NRSNG 6262	Pediatric Pharmacology	2

Pediatric Care Practicum

NRSNG 6460	Care of Well Child/Adolescent Health Promotion Practicum	4
NRSNG 6461	Child/Adolescent Health Problems Practicum	4

Research Core

NRSNG 7105	Translating Research Evidence into Practice	3
NRSNG 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 sixteen 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 licensed as an RN, the student acquires full-time RN work experience. This part of the program (two semesters) requires at least six to nine months of work experience as an RN before resuming classes (including one year of experience in pediatrics and two years of experience in adult acute care and neonatal). 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 (NRSNG 5117), Pathophysiology for Advanced Practice (NRSNG 5126), and Health Informatics (NRSNG 6306)**.

Core Courses

NRSNG 2210	Influences on Health and Illness: A Nursing Perspective	3
NRSNG 2220 and NRSNG 2221	Nursing Interventions, Assessment, and Community Care and Lab for NRSNG 2220	5
NRSNG 3302 and NRSNG 3303	Nursing with Women and Families and Clinical for NRSNG 3302	5
NRSNG 3320 and NRSNG 3321	Nursing Care of Adults 1 and Clinical for NRSNG 3320	6
NRSNG 3323 and NRSNG 3324	Intermediate Interventions and Assessment and Lab for NRSNG 3323	2
NRSNG 3400 and NRSNG 3401	Nursing and the Promotion of Mental Health and Clinical for NRSNG 3400	5
NRSNG 3420 and NRSNG 3421	Nursing Care of Adults 2 and Clinical for NRSNG 3420	6
NRSNG 4502 and NRSNG 4503	Nursing Care of the Child and Clinical for NRSNG 4502	6
NRSNG 4604 and NRSNG 4605	Public Health Community Nursing and Clinical for NRSNG 4604	5
NRSNG 4610	Managing and Leading in Healthcare	4
NRSNG 5117	Advanced Pharmacology	2
NRSNG 5126	Pathophysiology for Advanced Practice	3
NRSNG 6306	Health Informatics	3

Research and Practicum

HLTH 5450	Healthcare Research	4
NRSNG 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

Professional Core

NRSNG 5118	Healthcare System and Professional Role Development	3
NRSNG 5121	Epidemiology and Population Health	3
NRSNG 7105	Translating Research Evidence into Practice	3
NRSNG 7110	Evidence-Based Practice Research Application	2

Program Core

NRSNG 6300	Healthcare Finance and Marketing	3
NRSNG 6302	Health Policy and Law	3
NRSNG 6306	Health Informatics	3
NRSNG 6344	Healthcare Quality Improvement	3
NRSNG 6444	Healthcare Systems and Quality Patient Care	3
NRSNG 6510	Nursing Leadership Role Practicum 1	3
NRSNG 6520	Nursing Leadership Role Practicum 2	3

Electives

Complete 6 semester hours from the following:		6
NRSNG 6301	Human Resources and Operations	
NRSNG 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, 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.

The Bouvé program received funding from the Department of Health and Human Services to increase its size and diversity. As a result, many of our students receive stipends, grants, and tuition assistance.

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 ten 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 2015 was 80 percent and 100 percent with second-time takers.
- Graduates in 2015 obtained employment within three months of graduation.
- The attrition rate for the graduating class in 2015 was 13.6 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 twelve courses in nursing and twelve 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>)

David P. Zgarrick, PhD, RPh, FAPhA

Professor and Acting Dean

Diomedes Logothetis, PhD

Professor and Chair, Department of Pharmaceutical Sciences

Heather Clark, PhD

Associate Professor and Program Director, Biomedical Nanotechnology

Michael J. Gonyeau, PharmD, RPh, MEd, FCCP, BCPS

Clinical Professor and Acting Chair of the Department of Pharmacy and Health Systems Sciences

Ban-An Khaw, PhD

Professor and Acting Director, Graduate Programs, Department of Pharmaceutical Sciences

Jenny A. Van Amburgh, PharmD, RPh, FAPhA, BCACP, CDE

Clinical Professor and Assistant Dean for Academic Affairs

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.

Pharmaceutical Science

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 pharmaceuticals 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 MS in Pharmaceutical Sciences (interdisciplinary concentration).

Programs

Doctor of Philosophy (PhD)

- Biomedical Sciences (p. 235)
- Medicinal Chemistry (p. 235)
- Pharmaceutical Sciences (p. 236)
- Pharmacology (p. 236)

Doctor of Pharmacy (PharmD)

- Doctor of Pharmacy (p. 237)
- Doctor of Pharmacy—Direct Entry (p. 237)

Master of Science (MS)

- Biomedical Nanotechnology (p. 240)
- Biomedical Sciences (p. 240)
- Medicinal Chemistry (p. 241)
- Pharmaceutical Sciences (p. 241)
- Pharmacology (p. 241)

Dual Degree

- Pharmacy and Public Health, PharmD/MPH (p. 221)

Biomedical Sciences, PhD

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

Required Core

Complete 13–18 semester hours from the following: 13-18

PHSC 5100	Concepts in Pharmaceutical Science	
PHSC 5300 or PHSC 7010	Pharmaceutical Biochemistry 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 or BIOL 6381	Research Skills and Ethics 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: PHSC, PMCL, PMST, BIOL, CHEM, NNMD, BIOT 7-12

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

Qualifying Exam

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

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. Concentrations 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

Core Courses

PHSC 5100	Concepts in Pharmaceutical Science	2
PHSC 6210	Drug Design, Evaluation, and Development	2
BIOL 6381 or PHSC 6212	Ethics in Biological Research Research Skills and Ethics	2

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 6226	Imaging in Medicine and Drug Discovery	2

Electives

Complete 6–7 semester hours from 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

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 or PHSC 7010	Pharmaceutical Biochemistry Pharmaceutical Sciences Laboratory	
PHSC 6212 or BIOL 6381	Research Skills and Ethics 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:		
PHSC 6300	Pharmaceutical Science Seminar	1

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:		
PHSC 9990	Dissertation	6

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

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 or PHSC 7010	Pharmaceutical Biochemistry Pharmaceutical Sciences Laboratory	
PHSC 5310	Cellular Physiology	
PHSC 6212 or BIOL 6381	Research Skills and Ethics 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:

PHSC 6300	Pharmaceutical Science Seminar	2
-----------	--------------------------------	---

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	6
-----------	--------------	---

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) web page.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

YEAR 1

Summer Term

Complete 12 semester hours from the following range:	12
PHMD 6440 to PHMD 6474	

YEAR 2

Fall Term

Complete 12 semester hours from the following range:	12
PHMD 6440 to PHMD 6474	

Spring Term

Complete 12 semester hours from 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 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 achieve a minimum prerequisite 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 School of Pharmacy (SOP) academic affairs committee.

The pharmacy curriculum includes introductory (cooperative education) and advanced pharmacy practice experiences. 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.

Introductory pharmacy practice experiences (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 complete one IPPE in a community setting and one IPPE in an institutional/hospital practice setting.

Advanced pharmacy practice experience (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 Doctor of Pharmacy degree (PharmD), a student must successfully complete all courses in the curriculum including the introductory (co-op) and advanced pharmacy practice experiences; 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 Graduate Policies and Regulations*. The pharmacy program, which is fully accredited by the Accreditation Council for Pharmacy Education (info@acpe-accredit.org), subscribes to the standards established by ACPE and the American Association of Colleges of Pharmacy.

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 1,740 internship hours, all of which are satisfied through the introductory (co-op) and APPEs.

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) 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.
9. Attendance at scheduled on-campus APPE meetings during the APPE year:
 - a. Fall semester: midpoint APPE meeting;
 - b. Spring semester: exit meeting.

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 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 and ethical 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 grade-point average 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. 30).

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	3
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 from the following range:		12
PHMD 6440 to PHMD 6474		

YEAR 4**Fall Term**

Complete 12 semester hours from the following range:		12
PHMD 6440 to PHMD 6474		

Spring Term

Complete 12 semester hours from 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**Pharmaceutical**

CHME 5699	Special Topics in Chemical Engineering	4
or PMST 6252	Pharmacokinetics and Drug Metabolism	
PHSC 5100	Concepts in Pharmaceutical Science	2
PHSC 5300	Pharmaceutical Biochemistry	2
PHSC 5305	Professional Development for Pharmaceutical Sciences	1
PHSC 6212	Research Skills and Ethics	1

or BIOL 6381	Ethics in Biological Research	
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**Program Requirements**

Complete all courses and requirements listed below unless otherwise indicated.

Requirements**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 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

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

Core Courses

PHSC 5100	Concepts in Pharmaceutical Science	2
PHSC 6210	Drug Design, Evaluation, and Development	2
BIOL 6381 or PHSC 6212	Ethics in Biological Research Research Skills and Ethics	2

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 6226	Imaging in Medicine and Drug Discovery	2

Electives

Complete 6–7 semester hours from 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

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

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 or BIOL 6381	Research Skills and Ethics Ethics in Biological Research	1
PHSC 5300 or PHSC 7010	Pharmaceutical Biochemistry Pharmaceutical Sciences Laboratory	2
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

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 or PHSC 7010	Pharmaceutical Biochemistry Pharmaceutical Sciences Laboratory	
PHSC 5310	Cellular Physiology	
PHSC 6212 or BIOL 6381	Research Skills and Ethics 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	3
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 5210	Biostatistics in Public Health	3
PHTH 6204	Society, Behavior, and Health	3
PHTH 6200	Principles and History of Urban Health	3
PHTH 6966	Practicum	1-4
PHTH 5202	Epidemiology	3,4
PHTH 5212	Public Health Administration and Policy	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 5214	Environmental Health	3
PHTH 5120	Race, Ethnicity, and Health in the United States	3
PHTH 6901	Capstone 1	1
PHTH 6902	Capstone 2	2

Electives

Complete 9 semester hours from the following subject area:	9
PHTH	

Program Credit/GPA Requirements

156 total semester hours required

Minimum 3.000 GPA required

Physical Therapy, Movement, and Rehabilitation SciencesWebsite (<http://www.northeastern.edu/bouve/pt>)**Maura Daly Iversen, PT, DPT, SD, MPH, FNAP, FAPTA**

Professor and Chair

301 Robinson Hall

617.373.3908

617.373.3161 (fax)

physicaltherapy@northeastern.edu

Graduate Program Directors**Nancy Sharby, PT, DPT, MS**

Assistant Clinical Professor, Disability Studies Program

Sonya Larrieux, PT, MA, C/NDT

Director Post Baccalaureate DPT Program

Diane Fitzpatrick, PT, DPT, MS, GCS, CEEAA

Associate Director Post Baccalaureate DPT Program

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 projects, 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, 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 Advanced Graduate Studies (CAGS) for licensed practicing physical therapists (PTs) and a sports residency program for PTs. Our degree programs incorporate cooperative experiential learning, 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 programs 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 twelve Department of Physical Therapy, Movement, and Rehabilitation Science's labs and centers; including:

- Neuromotor Systems Laboratory
- Laboratory for Locomotion Research
- Cancer Survivorship Center
- 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. 245)
- Physical Therapy—Direct Entry (p. 245)
- Transitional Doctor of Physical Therapy (p. 267)

Master of Science (MS)

- Occupational Ergonomics and Health (p. 244)

Graduate Certificate

- Early Intervention (p. 215)
- Advanced Study in Orthopedic Physical Therapy (p. 301)

- Disability Studies (p. 244)

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 that 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

Requires 16 semester hours:

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, MS

301 Robinson Hall
617.373.3908
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	Epidemiology	3,4
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 any 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

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-](http://catalog.northeastern.edu/undergraduate/health-sciences/physical-therapy-movement-rehabilitation/dpt)

[therapy-movement-rehabilitation/dpt](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

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:		
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—Direct Entry

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 thirty-six 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 that offer them an opportunity to 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. 215) 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 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). 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**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 from 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

Physician Assistant

Website (<http://www.northeastern.edu/bouve/pa>)

Trenton Honda, MMS, PA-C

Program Director and Assistant Clinical Professor

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. 247)

Dual Degree (MS/MPH)

- Physician Assistant Studies and Masters of Public Health (p. 248)

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

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

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 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 MS in Physician Assistant Studies.

Since its inception in 2007, 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 United States' 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

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 5210	Biostatistics in Public Health	3
PHTH 5214	Environmental Health	3
PHTH 5202	Epidemiology	3,4
PHTH 5212	Public Health Administration and Policy	3
PHTH 1120	Society and Health	4
PHTH 6200	Principles and History of Urban Health	3
PHTH 5120	Race, Ethnicity, and Health in the United States	3
PHTH 6208	Urban Community Health Assessment	3
PHTH 6966	Practicum	1-4
PHTH 6910	Public Health Capstone	3

Electives

Complete 5–9 semester hours from the following:		5-9
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 5234	Economic Perspectives on Health Policy	
PHTH 5540	Health Education and Program Planning	
PHTH 5976	Directed Study	
PHTH 6202	Intermediate Epidemiology	
PHTH 6210	Applied Regression Analysis	
PHTH 6320	Qualitative Methods in Health and Illness	
PHTH 6400	Principles of Population Health 1	
PHTH 6410	Principles of Population Health 2	
PHTH 6440	Advanced Methods in Biostatistics	

Program Credit/GPA Requirements

133 total semester hours required
Minimum 3.000 GPA required

Interdisciplinary

Website (<http://www.northeastern.edu/bouve/interdisciplinary>)

Steve Cohen, PhD

Academic Director, Biotechnology Program

Biotechnology Program

109 Hurtig Hall

617.373.7578

617.373.8795 (fax)

Cynthia Bainton, Academic Manager, c.bainton@northeastern.edu

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

Associate Professor and Program Director, s.intille@northeastern.edu

Students in Northeastern University's graduate biotechnology program attain a common core knowledge of biotechnology with particular emphasis on the ability to integrate knowledge across disciplinary boundaries. Track objectives are to provide students with didactic and practical knowledge in protein analytical approaches and methodologies for activities and functions of biopharmaceuticals (biopharmaceutical analytical sciences); in formulation development and drug product manufacturing of biopharmaceuticals (pharmaceutical technologies); and in development and optimization of drug substance manufacturing of biopharmaceuticals (process sciences).

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. 249)

Master of Science (MS)

- Biotechnology (p. 249)
- Health Informatics (p. 93)
- Health Informatics—ALIGN (p. 94)

Graduate Certificate

- Aging (p. 252)
- Biopharmaceutical Analytical Sciences (p. 252)
- Early Intervention (p. 215)

- Health Informatics Management and Exchange (p. 253)
- Health Informatics Privacy and Security (p. 253)
- Health Informatics Software Engineering (p. 253)

Dual Degree

- Law and Urban Public Health, JD/MPH (p. 254)

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. 90).

Biotechnology, MS

Overview

The MS 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.

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 discover 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 are exposed to 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.

Biotechnology Enterprise Concentration

The biotechnology enterprise concentration integrates business and management skills with the science of biotechnology. Students are offered an opportunity to learn the fundamental concepts of leadership, entrepreneurship and innovation, financial decision making, and marketing. In the process, the concentration seeks to encourage students to gain teamwork, management, and business development skills and graduate prepared to become scientist-managers.

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 study 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.

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 study 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. Both lecture courses and project-driven laboratory experience offer hands-on study of cell culture and protein separation.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

General Core

BIOT 5120	Introduction to Biotechnology	3
BIOT 5631	Cell Culture Processes for Biopharmaceutical Production	3
BIOT 5219	The Biotechnology Enterprise	2
BIOL 6299	Molecular Cell Biology for Biotechnology	3
CHEM 5620	Protein Chemistry	3
PHSC 6214	Experimental Design and Biostatistics	2
BIOT 5130	Team Skills in Biotechnology	2
CHEM 5660	Analytical Biochemistry	3

Co-op

BIOT 6500	Professional Development for Co-op	0
BIOT 6964	Co-op Work Experience	0

Concentrations

Complete one of the following four concentrations:

- Biopharmaceutical Analytical Sciences Concentration (p. 250)
- Biotechnology Enterprise Concentration (p. 250)
- 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
Elective		3

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

Elective		4
----------	--	---

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
Elective		3

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
Elective		3

Program Credit/GPA Requirements

34 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 under the Department of Health Sciences:

- 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	Epidemiology	

One course from the following may count toward the technical core requirement:

DS 6020		
DS 6030		
PPUA 6301	Introduction to Computational Statistics	
PPUA 6302	Information Design and Visual Analytics	

Elective Core

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	
DS 6020		
DS 6030		
PPUA 6301	Introduction to Computational Statistics	
PPUA 6302	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 web page (<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:

HINF 0200	Health and Medicine for Nonclinicians	3
HINF 6230	Strategic Topics in Programming For Health Professionals	3

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	Epidemiology

One course from the following may count toward the technical core requirement:

DS 6020	
DS 6030	
PPUA 6301	Introduction to Computational Statistics
PPUA 6302	Information Design and Visual Analytics

Elective Core

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
DS 6020	
DS 6030	
PPUA 6301	Introduction to Computational Statistics
PPUA 6302	Information Design and Visual Analytics

Program Credit/GPA Requirements39 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 twenty-first-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 Requirements12 total semester hours required
Minimum 3.000 GPA required**Biopharmaceutical Analytical Science, Graduate Certificate**

The Graduate Certificate in Biopharmaceutical Analytical Science 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. The certificate offers an opportunity for individuals, particularly those who are working in the various sectors of biotechnology—including basic research of biological systems, discovery, development, and manufacturing of biopharmaceuticals—to enhance their competency and practical skills, enabling 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.

CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis	3
CHEM 5660	Analytical Biochemistry	3
CHEM 5616	Protein Mass Spectrometry	3
CHEM 5617	Protein Mass Spectrometry Laboratory	3

Program Credit/GPA Requirements12 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, MS in Speech-Language Pathology, MS in Counseling Psychology).

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

Requirements

Complete all courses and requirements listed below unless otherwise indicated.

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

Requirements

Complete all courses and requirements listed below unless otherwise indicated.

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

Requirements

Complete all courses and requirements listed below unless otherwise indicated.

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

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 Bouvé College Masters of Public Health program (p. 219) for more information.

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. 255)

Legal Studies, MS—Online

This degree is designed for professionals who want general exposure to 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 will include concentrations in human resources law, business law, and health law.

Program Plan

Students will take one 3-semester-hour course per term. A term will be approximately eight weeks, and there will be two terms in each of three semesters (fall, spring, and summer). The semesters will be broken into two parts: A/B. The course work will be spread over ten terms or five semesters. Every student in their first semester will take two introduction to legal studies foundation courses. (These two courses are the only prerequisites.) Students then take four out of five core courses, plus three or four elective courses from any of three 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 ten 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 three concentrations plus a general track. The concentrations are:

- Business law
- Health law
- Human resources 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 sixteen-week semester
- Total of ten courses needed to graduate

TIME TO DEGREE COMPLETION

Normal completion time is twenty months (five semesters) of part-time study.

ADMISSION CYCLES

- Fall 1 session
- Spring 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

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

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

John Caron, EdD, Senior Associate Dean of Faculty and Academic Affairs
Margie Arnold, PhD, Assistant Dean of Faculty and Academic Affairs

David Fields, PhD, Assistant Dean of Faculty and Academic Affairs
Mya Mangawang, PhD, 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 (p. 257)
- Transfer Credit Policies (p. 257)
- Special Student Status (p. 257)
- Personal Professional Enrichment (PPE) (p. 258)
- New Student Orientation (On-Ground and Online) (p. 258)
- Academic Resources (p. 258)
- Attendance Requirements (p. 258)
- Reentry to Program (p. 259)
- Readmission to Program (p. 259)
- Full-Time Status (p. 259)
- Active-Duty Military Personnel (p. 260)
- Registration and Taking Courses (p. 260)
- Student Evaluation of Courses (EvaluationKit) (p. 261)
- Academic Progression Standards (p. 262)
- Reinstatement after Academic Dismissal (p. 262)
- Completing Degree Requirements (p. 262)
- Degrees, Majors, and Concentrations (p. 263)
- Seeking more than One Certificate or Degree (p. 263)
- Graduation Requirements (p. 264)
- Global Partnership Programs (p. 264)
- Accommodations for Students with Disabilities (p. 264)
- Personal Information (p. 264)
- Graduate Campus (p. 264)

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 8 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 8 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 web page (<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).

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 ISSI 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 9 credits each quarter. For graduate degree programs that require only 4-credit courses in the curriculum, such as the Master of Science in Regulatory Affairs for Drugs, Biologics, and Medical Devices, 8 credits is considered full-time enrollment. 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.

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 ISSI Office (<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 web page (<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 does 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 twelve-week courses. For four-, six-, and eight-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 read the course description 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 web page (<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 twelve weeks. Each full summer term runs for eight weeks.

Course durations are as follows:

- During the fall, winter, and spring terms, courses are scheduled for either six or twelve weeks.
- During the summer term, courses are scheduled for four, six, or eight weeks.

Course Add/Drop Policy

Refer to the academic calendar (<http://www.northeastern.edu/registrar/calendars.html>) for specific dates.

Students may add a four-week or six-week course within the first week of the course. For eight- and twelve-week courses, students may add a course within the first two 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 twenty 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 8 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 three times each academic year: winter, spring, 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 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, and fall. Students must submit the appropriate form to their student success specialist 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. 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 within ten days in order to ensure compliance with 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. 265)

Doctor of Law and Policy (DLP)

- Law And Policy (p. 267)

Transitional Doctor of Physical Therapy (DPT)

- Physical Therapy (p. 267)
- Physical Therapy—Direct Entry (p. 268)

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 opportunities, 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 (EdD) curriculum, teaching, learning, and leadership concentration seeks to help educational leaders develop the competencies, dispositions, and values required to pursue educational reform, based on a commitment to social justice. Students have an

opportunity to 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.

Higher Education Administration Concentration

The Doctor of Education (EdD) higher education administration concentration includes the study of practice and scholarship across a variety of postsecondary education settings, including community and four-year colleges, for-profit organizations, and research institutions. Addressing globalization trends in higher education, this concentration combines theoretical with practice-based concepts.

This concentration offers students an opportunity to conduct and apply research that advances administrative practice or theory in higher education administration. Students have an opportunity to further their understanding and utilization of research design as they interpret research literature and conduct research studies.

This program 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 (EdD) organizational leadership studies concentration 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 twenty-first-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:

EDU 7282	Quantitative Research	
EDU 7283	Qualitative Research	

Concentration

Complete one of the following three concentrations:

Concentration in Curriculum, Teaching, Learning, and Leadership

CURRICULUM, TEACHING, LEARNING, AND LEADERSHIP COURSES		
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 from 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

HIGHER EDUCATION ADMINISTRATION COURSES		
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

ELECTIVE COURSES

Complete 12 quarter hours from 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

ORGANIZATIONAL LEADERSHIP COURSES		
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
EDU 7278	Organization Theory and Design	3

ELECTIVE COURSES

Complete 12 quarter hours from 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 (<http://www.cps.neu.edu/courses/detail/PTH6900>), 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 6983	Topics in Physical Therapy
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% 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 (<http://www.cps.neu.edu/courses/detail/PTH6900>), 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: 35 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 6983	Topics in Physical Therapy
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 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. 269)

Master of Arts in Teaching (MAT)

- Teaching, Elementary Licensure (p. 270)
- Teaching, Secondary Licensure (p. 271)

Master of Education (MEd)

- Education (p. 272)

Master of Professional Studies (MPS)

- Analytics (<http://catalog.northeastern.edu/graduate/professional-studies/masters-degree-programs/analytics-mps>)
- Digital Media (p. 274)
- Geographic Information Technology (p. 275)
- Informatics (p. 277)

Master of Science (MS)

- Applied Nutrition (p. 278)
- Commerce and Economic Development (p. 278)
- Corporate and Organizational Communication (p. 279)
- Criminal Justice (p. 280)
- Global Studies and International Relations (p. 283)
- Human Services (p. 286)
- Leadership (p. 287)
- Nonprofit Management (p. 288)
- Project Management (p. 290)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Clinical Research Regulatory Affairs (p. 291)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in General Regulatory Affairs (p. 292)

- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in International Regulatory Affairs (p. 293)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Operational Regulatory Affairs (p. 294)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Regulatory Compliance (p. 295)
- Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Strategic Regulatory Affairs (p. 296)
- Regulatory Affairs of Food and Food Industries (p. 297)
- Respiratory Care Leadership (p. 298)
- Technical Communication (p. 298)

Master of Sports Leadership (MSLD)

- Sports Leadership (p. 299)

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 quarter hours):

HLS 6035	Advanced Intelligence Applications for Homeland Security	4
HLS 6983	Topics in Homeland Security	1-4
CJS 6015	Crisis Management	3
CJS 6125	Issues in National Security	3
CJS 6000	Management for Security Professionals	3
CJS 6010	Advanced Principles of Security Management and Threat Assessment	3

CJS 6005	Legal and Regulatory Issues for Security Management	3
CJS 6430	Risk Management	3
GST 6720	Emerging Infectious Diseases and Health Impacts of Social and Environmental Changes	4
GST 6300	Security and Terrorism	4
CMN 6060	Negotiation, Mediation, and Facilitation	3
CJS 6964	Co-op	0
INT 6943	Integrative Experiential Learning	3
CJS 5978	Independent Study	1-4

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 courses:

EDU 6023	Institute in Creating a Community of Learners/Behaviors	4
EDU 6300	Introduction to Language and Linguistics	4
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 6429	Variations in Child and Adolescent Development	4
EDU 6436	Best Practices for the Twenty-First-Century Education	4
EDU 6437	Assessment in Education	4
EDU 6438	Teachers as Curriculum Leaders	4
EDU 6452	Critical Scholarly Investigation: On Location	4
EDU 6462	Children's Literature	4
EDU 6465	Critical and Creative Thinking	4
EDU 6472	Advanced Special Education Strategies	4
EDU 6516	Sheltered English Instruction and Assessment	4
EDU 6520	Learning and the Brain: Translating Research into Practice	4
EDU 6528	Adaptive Learning/Behavior Management Strategies: Consultation and Collaboration	4
EDU 6530	Beyond Behavior Management	4
EDU 6569	Differentiated Instruction and Assessment in Mathematics	4

EDU 6570	Advanced Strategies in Literacy: Readers and Writers Who Struggle	4
----------	--	---

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 courses:

EDU 6023	Institute in Creating a Community of Learners/Behaviors	4
EDU 6300	Introduction to Language and Linguistics	4
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 6429	Variations in Child and Adolescent Development	4
EDU 6436	Best Practices for the Twenty-First-Century Education	4
EDU 6437	Assessment in Education	4
EDU 6438	Teachers as Curriculum Leaders	4
EDU 6452	Critical Scholarly Investigation: On Location	4
EDU 6462	Children's Literature	4
EDU 6465	Critical and Creative Thinking	4
EDU 6472	Advanced Special Education Strategies	4
EDU 6516	Sheltered English Instruction and Assessment	4
EDU 6520	Learning and the Brain: Translating Research into Practice	4

EDU 6528	Adaptive Learning/Behavior Management Strategies: Consultation and Collaboration	4
EDU 6530	Beyond Behavior Management	4
EDU 6569	Differentiated Instruction and Assessment in Mathematics	4
EDU 6570	Advanced Strategies in Literacy: Readers and Writers Who Struggle	4

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
----------	----------

Complete three of the following (12 quarter hours):

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.)	4
EDU 6340	Learning Analytics Concepts and Theories	4
EDU 6330	Digital Media Literacy	4

Concentration in Higher Education Administration

REQUIRED COURSES

		12
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	4
EDU 6203	Education Law, Policy, and Finance	4
EDU 6221	Enrollment, Retention, Graduation, Success	4

Complete one of the following:		4
EDU 6450	The Globalization of Education	
INT 6900	International Field Study Experience	

ELECTIVE COURSES

Complete 12 quarter hours from the following:

EDU 6520	Learning and the Brain: Translating Research into Practice	4
EDU 6319	How People Learn	4
EDU 6332	Open Learning	4
EDU 6330	Digital Media Literacy	4
EDU 6558	Issues in Education	1-4
EDU 6300	Introduction to Language and Linguistics	4
EDU 6534	Bilingualism, Second Language, and Literacy Development	4
EDU 6182	Educational Statistics	4

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
----------	----------

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:

EDU 6225	Capstone
----------	----------

Complete one of the following:

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:

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	4
EDU 6438	Teachers as Curriculum Leaders	4

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:

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

Digital Media, MPS

New innovations, breakthrough technologies, and changing consumer habits are redefining the media landscape—fueling demand for media professionals who can apply the latest tools and techniques to create compelling digital content.

In response, the Master of Professional Studies in Digital Media provides state-of-the-art digital media courses in moving image, information design, and narrative structure—elements that are critical to producing and developing content-rich and interactive experiences. Complementing the degree's core curriculum are six distinctive concentrations in 3D animation, game design, interactive design, digital video, digital media management, or social media.

Differentiating this digital media master's degree is its cohort format, a team-based structure that allows you to complete your degree with the same group of students. Designed to strengthen your project management and leadership skills, cohorts enable you to collaborate with your colleagues on complex, multimedia projects, preparing you to excel in an increasingly digital world.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Core Courses

Complete 33 quarter hours:

DGM 6105	Visual Communications Foundation	4
DGM 6108	Programming Foundations for Digital Media	4
DGM 6122	Foundations of Digital Storytelling	4
DGM 6501	Web Creation Boot Camp	2
DGM 6511	Web Creation Bootcamp 2	2
DGM 6145	Information Technology and Creative Practice	4
DGM 6140	Sound Design	4
DGM 6890	Thesis Proposal Development	1-2
DGM 7990	Thesis	3-6

Complete one of the following:

DGM 6125	Time-Based Media	
DGM 6168	Usability and Human Interaction	

Elective

DGM 6322	Advanced Digital Storytelling	4
----------	-------------------------------	---

Concentration

Complete one of the following six concentrations:

Concentration in 3D Animation

Complete four of the following:

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 four of the following:		
DGM 6230	Digital Media Entrepreneurship	4
DGM 6280	Managing for Digital Media	4
DGM 6285	Interactive Marketing Fundamentals	4
DGM 6290	Social Media and Brand Strategy Implementation	4
DGM 6279	Project Management for Digital Media	4

Concentration in Digital Video

Complete four of the following:		
DGM 6300	Digital Capture and Output	4
DGM 6435	Digital Video Production	4
DGM 6440	Editing in the Digital Studio	4
DGM 6520	Lighting for the Camera	4
DGM 6540	Compositing	4
DGM 6545	Documentary and Nonfiction Production	4
DGM 6430	Screenwriting: Linear and Interactive	4

Concentration in Game Design

Complete four of the following:		
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

Concentration in Interactive Design

REQUIRED COURSE		
DGM 6461	Interactive Information Design 1	4

TRACK

Complete one of the following two tracks:

Design Track

Complete three of the following:		
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

Complete three of the following:		
DGM 6451	Web Development	4
DGM 6268	Usable Design for Mobile Digital Media	4
DGM 6308	Intermediate Programming for Digital Media	4
DGM 6471	Designing Infographics	4
TCC 6710	Content Strategy	4
TCC 6110	Information Architecture	4

Concentration in Social Media

Complete four of the following:		
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

Workshops

Optional digital media workshops are designed to provide valuable technical skills and tools for students in all graduate degree programs. Students may choose one of the following workshops:

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

Program Credit/GPA Requirements

49 total quarter hours required
Minimum 3.000 GPA required

Geographic Information Technology, MPS

Increased interest in geographic information and its applications is fueling demand for surveyors, cartographers, photogrammetrists, and mapping technicians. In response to this increased demand, Northeastern University's College of Professional Studies has developed the Master of Professional Studies in Geographic Information Technology (GIT).

Designed to advance your technical expertise, this online degree in geographic information technology explores a range of topics that are essential to the geographic information systems (GIS) field—from project management and system implementation to database design and execution. In addition, advanced concepts and techniques in areas such as raster-based GIS, geospatial information, and GIS modeling are also addressed within this online master's degree. Combining technical knowledge with hands-on GIS training, this results-oriented program seeks to enhance your skills and broaden your knowledge base—equipping you to competently apply GIS in your chosen field.

Note: High-speed internet service is required for course work in this program.

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:		5-10
CMN 6000 and INT 6000	Introduction to Organizational Communication and Writing Lab	
ITC 6020	Information Systems Design and Development	
ITC 6045	Information Technology Policy, Ethics, and Social Responsibility	
LDR 6100	Developing Your Leadership Capability	
LDR 6125	Managing Organizational Culture	
PJM 5900	Foundations of Project Management	

Concentration

Complete one of the following two concentrations:

Concentration in Geographic Information Systems

Concentration Courses

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	GIS Management and 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	

Open Electives

Complete 6 quarter hours from the following:		6
GIS 6340	GIS Customization	
GIS 6350	GIS Management and 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	
RMS 6110	Digital Image Processing	
RMS 6220	Geographic Information Systems for Remote Sensing	
RMS 6230	Remote Sensing and Global Change	
RMS 6240	Introduction to Radar and LIDAR Remote Sensing	

RMS 6250	Remote Sensing of Vegetation	
RMS 6260	Remote Sensing for Archaeology	
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	
COP 6940	Personal and Career Development	
INT 6943	Integrative Experiential Learning	

Concentration in 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 6220	Geographic Information Systems for Remote Sensing	
RMS 6230	Remote Sensing and Global Change	
RMS 6240	Introduction to Radar and LIDAR Remote Sensing	
RMS 6250	Remote Sensing of Vegetation	
RMS 6260	Remote Sensing for Archaeology	
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	

Open Electives

Complete 6 quarter hours from the following:		6
GIS 6340	GIS Customization	
GIS 6350	GIS Management and 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	
RMS 6110	Digital Image Processing	
RMS 6220	Geographic Information Systems for Remote Sensing	
RMS 6230	Remote Sensing and Global Change	
RMS 6240	Introduction to Radar and LIDAR Remote Sensing	
RMS 6250	Remote Sensing of Vegetation	
RMS 6260	Remote Sensing for Archaeology	

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
COP 6940	Personal and Career Development
INT 6943	Integrative Experiential Learning

ITC 6355	Web Application Design and Development
ITC 7120	Healthcare Information Systems
GIS 5101	Introduction to Geographic Information Systems
GIS 5102	Fundamentals of GIS Analysis
GIS 6360	Spatial Databases
GIS 6370	Internet-Based GIS
PJM 6000	Project Management Practices
TCC 6110	Information Architecture
TCC 6120	Usability and User Experience

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 3D 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.

Programs Requirement

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

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
ITC 6040	Informatics Capstone	3
ITC 6045	Information Technology Policy, Ethics, and Social Responsibility	3
ITC 6300	Foundations of Information Security	3
ITC 6345	Systems and Network Administration	3

Elective Courses

Complete 3–4 quarter hours from the following:		3-4
DGM 6500	Working with Digital Images	
DGM 6501	Web Creation Boot Camp	
DGM 6511	Web Creation Bootcamp 2	
DGM 6145	Information Technology and Creative Practice	
ITC 6015	Enterprise Information Architecture	
ITC 6030	Computer Systems and Networks	
ITC 6335	Data Warehousing and Data Mining	
ITC 6340	Mobile and Wireless Networks and Applications	

Concentration

Complete one of the following four concentrations:

Concentration in Information Security Management

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
Complete two of the following:		6-8
ITC 6325	CISA Preparation	
ITC 6330	CISSP Preparation	
MIS 6082	Network Protection	
MIS 6080	Network Security Concepts	

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	GIS Management and 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

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:		
NTR 6119	Pediatric Nutrition	4
NTR 6120	Healthy Aging: Nutrition Strategies for Optimal Longevity	4
NTR 6101	Nutrition Program Planning	4

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:		
NTR 6120	Healthy Aging: Nutrition Strategies for Optimal Longevity	4
NTR 6101	Nutrition Program Planning	4

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:		
NTR 7140	Wellness and Nutrition	4
NTR 7135	Eating Disorders in Children and Adults	4

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:

CED 6070	Economics of Human Capital	4
CED 6080	Commerce, Institutions, and Innovation	4
CED 6090	Cultural Economic Development	4
CED 6110	Law and Economics	4
CED 6120	Environmental Economics	4
CED 6130	Sustainable Economic Development	4
CED 6140	Economics of E-Commerce	4
COP 6940	Personal and Career Development	4

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 6050	Crisis Communication	3
CMN 6090	Organizational Culture, Climate, and Communication	3
CMN 6100	Communication Networks and Managing Information	3
CMN 6910	Organizational Communication Assessment	3

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 6061	Personal Branding	
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	
CMN 6060	Negotiation, Mediation, and Facilitation	
COP 6940	Personal and Career Development	
INT 6943	Integrative Experiential Learning	
INT 6900	International Field Study Experience	
INT 6940	Experiential Learning Projects for Professionals	

Concentration

Complete one of the following six 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

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 6280	Managing for Digital Media	
PBR 6710	Public Relations Research: Understanding External Audiences	

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 6140	Strategic Leadership	3-6

Leadership Electives

Complete one of the following:

LDR 6135	Ethical Leadership	3
LDR 6125	Managing Organizational Culture	3

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

Complete two of the following: 6-7

Note: Students who take PJM 5900 are required to take only one course in this section:

PJM 5900	Foundations of Project Management	
PJM 6125	Project Evaluation and Assessment	
PJM 6135	Project Quality Management	
PJM 6140	Managing Troubled Projects	
PJM 6705	Portfolio Management in the Enterprise Environment	

Concentration in Social Media and Online Communication

Complete five of the following: 15-18

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	

TCC 6710	Content Strategy	
----------	------------------	--

Concentration in Usability/User Experience

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	

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 6340	Substance Abuse and Addictions	3	ELECTIVE		
CJS 6305	Criminal Behavior and the Family	3	Complete 3 quarter hours from the following:		
CJS 6135	Intimate Partner Violence	3	CJS 6005	Legal and Regulatory Issues for Security Management	3
ELECTIVE			CJS 6010	Advanced Principles of Security Management and Threat Assessment	3
Complete 3 quarter hours from the following:			CJS 6025	Genocide and War Crimes	3
CJS 6005	Legal and Regulatory Issues for Security Management	3	CJS 6030	Organized Crime	3
CJS 6010	Advanced Principles of Security Management and Threat Assessment	3	CJS 6035	Corruption, Integrity, and Accountability	3
CJS 6025	Genocide and War Crimes	3	CJS 6040	Human Trafficking and Exploitation	3
CJS 6030	Organized Crime	3	CJS 6045	Policing Issues around the Globe	3
CJS 6035	Corruption, Integrity, and Accountability	3	CJS 6050	Models of Intelligence-Led Policing	3
CJS 6040	Human Trafficking and Exploitation	3	CJS 6105	Domestic and International Terrorism	3
CJS 6045	Policing Issues around the Globe	3	CJS 6110	Management of Service Industries Security Department	3
CJS 6050	Models of Intelligence-Led Policing	3	CJS 6120	Preventing Service Industries Losses	3
CJS 6105	Domestic and International Terrorism	3	CJS 6125	Issues in National Security	3
CJS 6110	Management of Service Industries Security Department	3	CJS 6135	Intimate Partner Violence	3
CJS 6120	Preventing Service Industries Losses	3	CJS 6140	Security Role: Safety and Environment Protection	3
CJS 6125	Issues in National Security	3	CJS 6145	Correctional Rehabilitation	3
CJS 6135	Intimate Partner Violence	3	CJS 6205	Law Enforcement Management and Planning	3
CJS 6140	Security Role: Safety and Environment Protection	3	CJS 6300	Communities and Crime	3
CJS 6145	Correctional Rehabilitation	3	CJS 6305	Criminal Behavior and the Family	3
CJS 6205	Law Enforcement Management and Planning	3	CJS 6315	Administration of the Adult and Juvenile Correction Systems	3
CJS 6300	Communities and Crime	3	CJS 6320	Community Corrections	3
CJS 6305	Criminal Behavior and the Family	3	CJS 6325	Probation and Parole	3
CJS 6315	Administration of the Adult and Juvenile Correction Systems	3	CJS 6330	Youth Justice and Crime	3
CJS 6320	Community Corrections	3	CJS 6340	Substance Abuse and Addictions	3
CJS 6325	Probation and Parole	3	CJS 6420	U.S. Policing in the Twenty-First Century	3
CJS 6330	Youth Justice and Crime	3	GST 6300	Security and Terrorism	4
CJS 6340	Substance Abuse and Addictions	3	LDR 6110	Leading Teams	3-6
CJS 6420	U.S. Policing in the Twenty-First Century	3	LDR 6120	Organizational Leadership	3-6
GST 6300	Security and Terrorism	4	LDR 6125	Managing Organizational Culture	3
LDR 6110	Leading Teams	3-6	LDR 6140	Strategic Leadership	3-6
LDR 6120	Organizational Leadership	3-6	LDR 6360	Dynamics of Change at the Community and Social Level	3
LDR 6125	Managing Organizational Culture	3	INT 6943	Integrative Experiential Learning	2
LDR 6140	Strategic Leadership	3-6			
LDR 6360	Dynamics of Change at the Community and Social Level	3			
INT 6943	Integrative Experiential Learning	3			

Concentration in Corrections

CORRECTIONS COURSES

Complete five of the following:

CJS 6145	Correctional Rehabilitation	3
CJS 6300	Communities and Crime	3
CJS 6315	Administration of the Adult and Juvenile Correction Systems	3
CJS 6325	Probation and Parole	3
CJS 6320	Community Corrections	3

Concentration in Global Criminal Justice

GLOBAL CRIMINAL JUSTICE COURSES

Complete five of the following:

CJS 6025	Genocide and War Crimes	3
CJS 6030	Organized Crime	3
CJS 6035	Corruption, Integrity, and Accountability	3
CJS 6040	Human Trafficking and Exploitation	3
CJS 6045	Policing Issues around the Globe	3
CJS 6105	Domestic and International Terrorism	3
CJS 6125	Issues in National Security	3
GST 6300	Security and Terrorism	4
ELECTIVE		

Complete 3 quarter hours from the following:

CJS 6005	Legal and Regulatory Issues for Security Management	3
CJS 6010	Advanced Principles of Security Management and Threat Assessment	3
CJS 6025	Genocide and War Crimes	3
CJS 6030	Organized Crime	3
CJS 6035	Corruption, Integrity, and Accountability	3
CJS 6040	Human Trafficking and Exploitation	3
CJS 6045	Policing Issues around the Globe	3
CJS 6050	Models of Intelligence-Led Policing	3
CJS 6105	Domestic and International Terrorism	3
CJS 6110	Management of Service Industries Security Department	3
CJS 6120	Preventing Service Industries Losses	3
CJS 6125	Issues in National Security	3
CJS 6135	Intimate Partner Violence	3
CJS 6140	Security Role: Safety and Environment Protection	3
CJS 6145	Correctional Rehabilitation	3
CJS 6205	Law Enforcement Management and Planning	3
CJS 6300	Communities and Crime	3
CJS 6305	Criminal Behavior and the Family	3
CJS 6315	Administration of the Adult and Juvenile Correction Systems	3
CJS 6320	Community Corrections	3
CJS 6325	Probation and Parole	3
CJS 6330	Youth Justice and Crime	3
CJS 6340	Substance Abuse and Addictions	3
CJS 6420	U.S. Policing in the Twenty-First Century	3
GST 6300	Security and Terrorism	4
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6125	Managing Organizational Culture	3
LDR 6140	Strategic Leadership	3-6
LDR 6360	Dynamics of Change at the Community and Social Level	3
INT 6943	Integrative Experiential Learning	2

Concentration in Leadership

LEADERSHIP COURSES

LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6125	Managing Organizational Culture	3
LDR 6140	Strategic Leadership	3-6
LDR 6360	Dynamics of Change at the Community and Social Level	3

ELECTIVE

Complete 3 quarter hours from the following:

CJS 6005	Legal and Regulatory Issues for Security Management	3
CJS 6010	Advanced Principles of Security Management and Threat Assessment	3
CJS 6025	Genocide and War Crimes	3

CJS 6030	Organized Crime	3
CJS 6035	Corruption, Integrity, and Accountability	3
CJS 6040	Human Trafficking and Exploitation	3
CJS 6045	Policing Issues around the Globe	3
CJS 6050	Models of Intelligence-Led Policing	3
CJS 6105	Domestic and International Terrorism	3
CJS 6110	Management of Service Industries Security Department	3
CJS 6120	Preventing Service Industries Losses	3
CJS 6125	Issues in National Security	3
CJS 6135	Intimate Partner Violence	3
CJS 6140	Security Role: Safety and Environment Protection	3
CJS 6145	Correctional Rehabilitation	3
CJS 6205	Law Enforcement Management and Planning	3
CJS 6300	Communities and Crime	3
CJS 6305	Criminal Behavior and the Family	3
CJS 6315	Administration of the Adult and Juvenile Correction Systems	3
CJS 6320	Community Corrections	3
CJS 6325	Probation and Parole	3
CJS 6330	Youth Justice and Crime	3
CJS 6340	Substance Abuse and Addictions	3
CJS 6420	U.S. Policing in the Twenty-First Century	3
GST 6300	Security and Terrorism	4
LDR 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6125	Managing Organizational Culture	3
LDR 6140	Strategic Leadership	3-6
LDR 6360	Dynamics of Change at the Community and Social Level	3
INT 6943	Integrative Experiential Learning	2

Concentration in Policing

POLICING COURSES

Complete five of the following:

CJS 6035	Corruption, Integrity, and Accountability	3
CJS 6045	Policing Issues around the Globe	3
CJS 6050	Models of Intelligence-Led Policing	3
CJS 6205	Law Enforcement Management and Planning	3
CJS 6300	Communities and Crime	3
CJS 6420	U.S. Policing in the Twenty-First Century	3

ELECTIVE

Complete 3 quarter hours from the following:

CJS 6005	Legal and Regulatory Issues for Security Management	3
CJS 6010	Advanced Principles of Security Management and Threat Assessment	3
CJS 6025	Genocide and War Crimes	3
CJS 6030	Organized Crime	3
CJS 6035	Corruption, Integrity, and Accountability	3

CJS 6040	Human Trafficking and Exploitation	3	CJS 6045	Policing Issues around the Globe	3
CJS 6045	Policing Issues around the Globe	3	CJS 6050	Models of Intelligence-Led Policing	3
CJS 6050	Models of Intelligence-Led Policing	3	CJS 6105	Domestic and International Terrorism	3
CJS 6105	Domestic and International Terrorism	3	CJS 6110	Management of Service Industries Security Department	3
CJS 6110	Management of Service Industries Security Department	3	CJS 6120	Preventing Service Industries Losses	3
CJS 6120	Preventing Service Industries Losses	3	CJS 6125	Issues in National Security	3
CJS 6125	Issues in National Security	3	CJS 6135	Intimate Partner Violence	3
CJS 6135	Intimate Partner Violence	3	CJS 6140	Security Role: Safety and Environment Protection	3
CJS 6140	Security Role: Safety and Environment Protection	3	CJS 6145	Correctional Rehabilitation	3
CJS 6145	Correctional Rehabilitation	3	CJS 6205	Law Enforcement Management and Planning	3
CJS 6205	Law Enforcement Management and Planning	3	CJS 6300	Communities and Crime	3
CJS 6300	Communities and Crime	3	CJS 6305	Criminal Behavior and the Family	3
CJS 6305	Criminal Behavior and the Family	3	CJS 6315	Administration of the Adult and Juvenile Correction Systems	3
CJS 6315	Administration of the Adult and Juvenile Correction Systems	3	CJS 6320	Community Corrections	3
CJS 6320	Community Corrections	3	CJS 6325	Probation and Parole	3
CJS 6325	Probation and Parole	3	CJS 6330	Youth Justice and Crime	3
CJS 6330	Youth Justice and Crime	3	CJS 6340	Substance Abuse and Addictions	3
CJS 6340	Substance Abuse and Addictions	3	CJS 6420	U.S. Policing in the Twenty-First Century	3
CJS 6420	U.S. Policing in the Twenty-First Century	3	GST 6300	Security and Terrorism	4
GST 6300	Security and Terrorism	4	LDR 6110	Leading Teams	3-6
LDR 6110	Leading Teams	3-6	LDR 6120	Organizational Leadership	3-6
LDR 6120	Organizational Leadership	3-6	LDR 6125	Managing Organizational Culture	3
LDR 6125	Managing Organizational Culture	3	LDR 6140	Strategic Leadership	3-6
LDR 6140	Strategic Leadership	3-6	LDR 6360	Dynamics of Change at the Community and Social Level	3
LDR 6360	Dynamics of Change at the Community and Social Level	3	INT 6943	Integrative Experiential Learning	2
INT 6943	Integrative Experiential Learning	2			

Concentration in Security**SECURITY COURSES**

Complete five of the following:

CJS 6010	Advanced Principles of Security Management and Threat Assessment	3
CJS 6005	Legal and Regulatory Issues for Security Management	3
CJS 6035	Corruption, Integrity, and Accountability	3
CJS 6045	Policing Issues around the Globe	3
CJS 6105	Domestic and International Terrorism	3
CJS 6125	Issues in National Security	3
GST 6300	Security and Terrorism	4

ELECTIVE

Complete 3 quarter hours from the following:

CJS 6005	Legal and Regulatory Issues for Security Management	3
CJS 6010	Advanced Principles of Security Management and Threat Assessment	3
CJS 6025	Genocide and War Crimes	3
CJS 6030	Organized Crime	3
CJS 6035	Corruption, Integrity, and Accountability	3
CJS 6040	Human Trafficking and Exploitation	3

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:

GST 6501	Regional Studies: East Asia	4
GST 6502	Regional Studies: Middle East	4
GST 6503	Regional Studies: Sub-Saharan Africa	4
GST 6504	Regional Studies: Europe	4
GST 6505	Regional Studies: Southwest and Central Asia	4
GST 6506	Regional Studies: Latin America	4

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:

GST 6102	Global Corporate and Social Responsibility	4
GST 6200	The Funders	4
GST 6210	The Developers	4
GST 6220	Globalization of Emerging Economies	4
GST 6300	Security and Terrorism	4
GST 6310	Immigration and Labor	4
GST 6324	Divided Societies in the Modern World	4
GST 6326	International Conflict and Cooperation	4
GST 6327	Conflict and Postconflict Development	4
GST 6340	Poverty and Wealth	4
GST 6350	Global Economics of Food and Agriculture	4
GST 6360	Nuclear Nonproliferation	4
GST 6410	Global Education in the Internet Age	4
GST 6430	Leadership and Management	4
GST 6540	Politics of the European Union	4
GST 6550	U.S. Foreign Policy	4
GST 6580	Opportunities in International Consulting	4
GST 6590	Public Diplomacy	4
GST 6600	The Practice of Diplomacy	4
GST 6610	Sustainable Development	4
GST 6700	Global Health Perspectives, Politics, and Experiences in International Development	4

GST 6710	Critical Issues and Challenges in the Practice of Global Health	4
GST 6740	Human Rights	4
GST 6810	International Higher Education	4
GST 6820	Managing Study Abroad	4
GST 6830	Managing International Students	4
GST 6840	The Business of International Education	4
GST 6850	Immigration and Legal Issues in International Higher Education	4
GST 7983	Topics	1-4
COP 6940	Personal and Career Development	4
Enrollment into this course requires participation in the cooperative education program.		
INT 6943	Integrative Experiential Learning	3

Concentrations

Complete one of the following five concentrations:

Concentration in Conflict Resolution

Complete five of the following:

GST 6324	Divided Societies in the Modern World	4
GST 6326	International Conflict and Cooperation	4
GST 6327	Conflict and Postconflict Development	4
GST 6300	Security and Terrorism	4
GST 6360	Nuclear Nonproliferation	4
GST 6740	Human Rights	4

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:

GST 6210	The Developers	4
GST 6340	Poverty and Wealth	4
GST 6350	Global Economics of Food and Agriculture	4
GST 6610	Sustainable Development	4
GST 6700	Global Health Perspectives, Politics, and Experiences in International Development	4
GST 6710	Critical Issues and Challenges in the Practice of Global Health	4

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:

GST 6600	The Practice of Diplomacy	4
GST 6540	Politics of the European Union	4
GST 6550	U.S. Foreign Policy	4
GST 6560	Multilateral Diplomacy	4
GST 6590	Public Diplomacy	4
GST 6740	Human Rights	4

One of five courses may be a global studies concentration course from the following list:

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:		
GST 6580	Opportunities in International Consulting	4
GST 6102	Global Corporate and Social Responsibility	4
GST 6200	The Funders	4
GST 6220	Globalization of Emerging Economies	4
GST 6310	Immigration and Labor	4
GST 6340	Poverty and Wealth	4
GST 6430	Leadership and Management	4
One of five courses may be a global studies concentration course from the following list:		
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:		
GST 6810	International Higher Education	4
GST 6820	Managing Study Abroad	4
GST 6830	Managing International Students	4
GST 6840	The Business of International Education	4

GST 6850	Immigration and Legal Issues in International Higher Education	4
GST 6410	Global Education in the Internet Age	4
One of five courses may be a global studies concentration course from the following list:		
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:

NPM 6120	Financial Management for 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
CMN 6015	Introduction to the Digital Era: The Power of Social Media	3
CMN 6080	Intercultural Communication	3
INT 6943	Integrative Experiential Learning	3

Concentrations

Complete one of the following three concentrations:

Concentration in Global Studies

GLOBAL STUDIES COURSES		
GST 6100	Globalization and Global Politics and Economics	4
GST 6101	Global Literacy, Culture, and Community	4
GST 6320	Peace and Conflict	4
GLOBAL STUDIES ELECTIVE		
Complete one of the following:		
GST 6501	Regional Studies: East Asia	4

GST 6502	Regional Studies: Middle East	4
GST 6503	Regional Studies: Sub-Saharan Africa	4
GST 6504	Regional Studies: Europe	4
GST 6505	Regional Studies: Southwest and Central Asia	4
GST 6506	Regional Studies: Latin America	4

Concentration in Leadership

LEADERSHIP COURSES		
LDR 6100	Developing Your Leadership Capability	3-6
LDR 6110	Leading Teams	3-6
LDR 6140	Strategic Leadership	3-6
LEADERSHIP ELECTIVE		
Complete one of the following:		
LDR 6135	Ethical Leadership	3
LDR 6125	Managing Organizational Culture	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

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

LDR 6125	Managing Organizational Culture	
CMN 6060	Negotiation, Mediation, and Facilitation	
CMN 6110	Group Dynamics and Interpersonal Conflict: Meeting Management	
CMN 6080	Intercultural Communication	
COP 6940	Personal and Career Development	
INT 6943	Integrative Experiential Learning	
CMN 6015	Introduction to the Digital Era: The Power of Social Media	

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:

PJM 6125	Project Evaluation and Assessment	3
PJM 6135	Project Quality Management	3
PJM 6140	Managing Troubled Projects	3
PJM 6705	Portfolio Management in the Enterprise Environment	3

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	
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 6110	Leading Teams	3-6
LDR 6120	Organizational Leadership	3-6
LDR 6125	Managing Organizational Culture	3
LDR 6135	Ethical Leadership	3
LDR 6140	Strategic Leadership	3-6

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 Courses¹

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 courses:² 6

PJM 6125	Project Evaluation and Assessment	
PJM 6135	Project Quality Management	
PJM 6140	Managing Troubled Projects	
PJM 6705	Portfolio Management in the Enterprise Environment	

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

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:

PJM 6125	Project Evaluation and Assessment	
PJM 6140	Managing Troubled Projects	
PJM 6145	Global Project Management	
PJM 6705	Portfolio Management in the Enterprise Environment	

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	
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	

Concentration

Complete one of the following eight concentrations:

Concentration in Clinical Trial Design

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
RGA 6210	Strategic Planning and Project Management for Regulatory Affairs	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

Geographic Information Systems 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

Geographic Information Systems Elective

Complete one of the following: 3

GIS 6340	GIS Customization	
GIS 6350	GIS Management and Implementation	
GIS 6370	Internet-Based GIS	
GIS 6360	Spatial Databases	

Concentration in Information Security Management

Information Security Management Courses

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

Information Security Management 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

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

Leadership Elective

Complete one of the following: 3-6

LDR 6125	Managing Organizational Culture	
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

<i>Organizational Communication Course</i>		
CMN 6000 and INT 6000	Introduction to Organizational Communication and Writing Lab	3-4

Organizational Communication 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 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 6201	New Drug Development: A Regulatory Overview	4
----------	---	---

RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6200	Biologics Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
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: 4

RGA 6100	Introduction to Drug and Medical Device Regulation	4
BTC 6211	Validation and Auditing of Clinical Trial Information	
RGA 6212	Introduction to Safety Sciences	
RGA 6230	Clinical Laboratory Management in Clinical Trials	
RGA 6310	Regulatory Documentation Processes	4
RGA 6280	Advanced Writing on International Biomedical Topics	

REGULATORY PERSPECTIVE: PRODUCT DEVELOPMENT, BUSINESS, AND STRATEGY

Complete at least one of the following: 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.)	4
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection	4

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	4

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 6100	Introduction to Drug and Medical Device Regulation	4
BTC 6210	Human Experimentation: Methodological Issues Fundamentals	4
RGA 6201	New Drug Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6200	Biologics Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
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: 4

BTC 6211	Validation and Auditing of Clinical Trial Information
BTC 6213	Clinical Trial Design Optimization and Problem Solving
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: 4

BTC 6260	The Business of Medicine and Biotechnology
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.)
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	4
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 6100	Introduction to Drug and Medical Device Regulation	4
RGA 6201	New Drug Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6200	Biologics Development: A Regulatory Overview	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: 4

BTC 6211	Validation and Auditing of Clinical Trial Information	
RGA 6212	Introduction to Safety Sciences	
BTC 6213	Clinical Trial Design Optimization and Problem Solving	
RGA 6370	Regulatory Writing: Medical Device Submissions	4
RGA 6380	Regulatory Writing: New Drug Applications	4
RGA 6280	Advanced Writing on International Biomedical Topics	

REGULATORY PERSPECTIVE

Complete at least one of the following: 4-5

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.)	4
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection	4

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	4

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	4
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 6100	Introduction to Drug and Medical Device Regulation	4
RGA 6201	New Drug Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6200	Biologics Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
RGA 6300	Practical Applications in Biomedical Product Global Regulatory Affairs	4
RGA 6370	Regulatory Writing: Medical Device Submissions	4
RGA 6380	Regulatory Writing: New Drug Applications	4

Required Electives

Students must earn a minimum of 12 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 6280	Advanced Writing on International Biomedical Topics	4
RGA 6310	Regulatory Documentation Processes	4
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

Complete at least one of the following: 4

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.)	4
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection	4

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 6224	Regulation of Biomedical Product Commercialization by Health Canada	4
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 6100	Introduction to Drug and Medical Device Regulation	4
RGA 6201	New Drug Development: A Regulatory Overview	4
RGA 6202	Medical Device Development: A Regulatory Overview	4
RGA 6200	Biologics Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
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	
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:

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.)	4
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection	4

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	4
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 6202	Medical Device Development: A Regulatory Overview	4
RGA 6200	Biologics Development: A Regulatory Overview	4
RGA 6203	Food, Drug, and Medical Device Law: Topics and Cases	5
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 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: 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.)	4
INT 6943 and RGA 6920	Integrative Experiential Learning and Internship Reflection	4

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	4
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 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
RPT 6970	Seminar	1-4

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:

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

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

<i>Required Course</i>		
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	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

Concentration in Usability/User Experience

Choose any combination of the following courses to complete 16 quarter hours:		
TCC 6710	Content Strategy	4
TCC 6470	Web Accessibility for Technical Communicators	4
DGM 6268	Usable Design for Mobile Digital Media	4
TCC 6610	Prototyping	2
TCC 6620	Collecting User Data	2
TCC 6420	Information Design for the Web	4

Open Electives

Choose a combination of 8–10 quarter hours of electives from the list below and any concentration courses above:		
TCC 6480	Instructional Design for Technical Communicators	4
TCC 6630	Introduction to XML	2
TCC 6640	Wiki-Based Documentation	2
TCC 6495	Document Design	2

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:

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. 300)
- Adult And Organizational Learning (p. 301)
- Advanced Study Of Orthopedics (p. 301)
- Collegiate Athletics Administration (p. 301)
- Construction Management (p. 302)
- Digital Media Management (p. 302)
- Digital Video (p. 302)
- Domestic Biopharmaceutical Regulatory Affairs (p. 303)
- eLearning And Instructional Design (p. 303)
- Financial Markets And Institutions (p. 303)
- Forensic Accounting (p. 304)
- Game Design (p. 304)
- Geographic Information Systems (p. 304)
- Global Student Mobility (p. 305)

- Global Studies And International Relations (p. 305)
- Health Management (p. 306)
- Higher Education Administration (p. 306)
- Human Resources Management (p. 306)
- Information Security Management (p. 307)
- Interactive Design (p. 307)
- Interdisciplinary Professional Studies (p. 307)
- International Biopharmaceutical Regulatory Affairs (p. 309)
- Leadership (p. 309)
- Leading And Managing Technical Projects (p. 309)
- Learning Analytics (p. 310)
- Medical Devices Regulatory Affairs (p. 310)
- Nonprofit Management (p. 311)
- Organizational Communication (p. 311)
- Port Security (p. 311)
- Professional Sports Administration (p. 312)
- Program And Portfolio Management (p. 312)
- Project Management (p. 312)
- Public And Media Relations (p. 313)
- Remote Sensing (p. 313)
- Respiratory Specialty Practice (p. 314)
- Social Media And Online Communities (p. 314)
- Teaching English to Speakers Of Other Languages (p. 314)

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 of 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 eighteen to thirty-six 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

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. 299) 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

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. 274) 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 6200	Biologics Development: A Regulatory Overview	4
RGA 6201	New Drug 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	The Food and Drug Administration: Creation, Behavior, Regulatory Culture	
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

Electives

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	GIS Management and 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
- Students can participate in interesting opportunities like this Evening with Philip Altbach event (<http://aspireblog.org/uncategorized/experts-debate-current-future-state-international-higher-education>).

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

Electives

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):

NPM 6110	Legal and Governance Issues in Nonprofit Organizations	3
NPM 6150	Human Resources Management in Nonprofit Organizations	3
HMG 6140	Principles of Population-Based Management	3
HMG 6150	Seminar in Health Services Research: Issues and Research	2
HMG 6160	Healthcare Information Systems Management	3
HMG 6170	Health Law, Politics, and Policy	3
HRM 6020	Strategic Recruitment, Training, and Performance Management	3

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 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 ten 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 6221	European Union Compliance Process and Regulatory Affairs	4
Complete two of the following:		8
RGA 6228	Managing International Clinical Trials	
RGA 6222	European Medical Device Regulations	
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	
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. 290), master's in leadership (p. 287), master's in corporate and organizational communication (p. 279), or master's in Informatics (p. 277).

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

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 6343	Predictive Modeling for Learning Analytics	4
EDU 6324	Competencies, Assessment, and 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

Medical Devices Regulatory Affairs Electives

Complete two of the following: 8-9

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
ITP 6305	Technology Licensing

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. 299) 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. 279).

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	

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 6220	Geographic Information Systems for Remote Sensing	
RMS 6230	Remote Sensing and Global Change	
RMS 6240	Introduction to Radar and LIDAR Remote Sensing	
RMS 6250	Remote Sensing of Vegetation	
RMS 6260	Remote Sensing for Archaeology	
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. 279).

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Required Courses

Complete six of the following: 19-21

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
TCC 6710	Content Strategy

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

Website (<http://www.northeastern.edu/cos/graduate>)

Kenneth W. Henderson, PhD, Dean

George O. Alverson, PhD, Associate Dean, Academic Affairs

David E. Budil, PhD, Associate Dean, Research

Frederick C. Davis, PhD, Associate Dean, Faculty Affairs

James Sarazen, MBA, Associate Dean, Administration and Finance

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 (p. 316)
- Course Registration (p. 316)
- Transfer Credit (p. 316)
- Awards (p. 316)
- Satisfactory Progress (p. 316)
- Time Limitation (p. 317)
- Changes in Requirements (p. 317)
- The Doctor of Philosophy Degree (PhD) (p. 317)
- The Master's Degree Academic Requirements (p. 318)

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. 26)").

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. Students who have not completed their thesis after having registered for the specified number of thesis credits must register and pay for Master's Continuation each subsequent semester until the thesis is approved and submitted to ProQuest. Master's Continuation will carry no credit but will be recorded on the student transcript with the appropriate grade (S or U) for each semester of registration. 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

Graduate Coordinator for Biology

Erin J. Cram, PhD, Associate Professor, e.cram@northeastern.edu

Graduate Coordinator for Bioinformatics

Steven Vollmer, PhD, Associate Professor and Director,

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. 318)
- Biology—Advanced Entry (p. 319)

Master of Science (MS)

- Bioinformatics (p. 319)
- Bioinformatics—ALIGN Program (p. 320)

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:

BIOL 5100	Biology Colloquium	1
-----------	--------------------	---

Dissertation Courses

Complete the following (repeatable) course twice:

BIOL 9990	Dissertation	0
-----------	--------------	---

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	

Electives¹

Complete 16 semester hours from the following: 16

BIOL 5103 to BIOL 8674

Concentrations

- Cell and Molecular Biology (p.)
- Molecular Microbiology (p. 319)

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**

BIOL 6399	Dynamics of Microbial Ecology	8
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	0

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	4
	1	

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, chosen in consultation with your faculty advisor:		12
BIOL 5000 to BIOL 8000		
BIOT 5120	Introduction to Biotechnology	
BIOT 5130	Team Skills in Biotechnology	
BIOT 5145	Basic Biotechnology Lab Skills	
BIOT 5219	The Biotechnology Enterprise	
BIOT 5560	Bioprocess Fundamentals	
BIOT 5631	Cell Culture Processes for Biopharmaceutical Production	
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations	
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	
DS 6020		
HINF 5101	Introduction to Health Informatics and Health Information Systems	
HINF 5200	Theoretical Foundations in Personal Health Informatics	
HINF 5300	Personal Health Interface Design and Development	
HINF 6205	Creation and Application of Medical Knowledge	
HINF 6220	Database Design, Access, Modeling, and Security	
HINF 6330	Emerging Technologies in Healthcare	
PHYS 5116	Complex Networks and Applications	
PHYS 7331	Network Science Data	

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 from the following, chosen in consultation with your faculty advisor:

BIOL 5000 to BIOL 8000		
BIOT 5120	Introduction to Biotechnology	
BIOT 5130	Team Skills in Biotechnology	
BIOT 5145	Basic Biotechnology Lab Skills	
BIOT 5219	The Biotechnology Enterprise	
BIOT 5560	Bioprocess Fundamentals	
BIOT 5631	Cell Culture Processes for Biopharmaceutical Production	
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations	
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
DS 6020	
HINF 5101	Introduction to Health Informatics and Health Information Systems
HINF 5200	Theoretical Foundations in Personal Health Informatics
HINF 5300	Personal Health Interface Design and Development
HINF 6205	Creation and Application of Medical Knowledge
HINF 6220	Database Design, Access, Modeling, and Security
HINF 6330	Emerging Technologies in Healthcare
PHYS 5116	Complex Networks and Applications
PHYS 7331	Network Science Data

Program Credit/GPA Requirements

36 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 Interim Chair

102 Hurtig Hall
617.373.2822

Graduate Administrative Officer

Cara Shockley, C.Shockley@northeastern.edu, 617.373.2824

Graduate Coordinator for Biotechnology

Jared Auclair, PhD, Academic Director for Biotechnology,
j.auclair@northeastern.edu

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 MS 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. 321)

- Chemistry—Advanced Entry (p. 322)

Master of Science (MS)

- Biotechnology (p. 249)
- Chemistry (p. 323)

Graduate Certificate

- Biopharmaceutical Analytical Science (p. 252)

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 MS 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.

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 discover 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 are exposed to 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.

Biotechnology Enterprise Concentration

The biotechnology enterprise concentration integrates business and management skills with the science of biotechnology. Students are offered an opportunity to learn the fundamental concepts of leadership, entrepreneurship and innovation, financial decision making, and marketing. In the process, the concentration seeks to encourage students to gain teamwork, management, and business development skills and graduate prepared to become scientist-managers.

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 study 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.

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 study 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. Both lecture courses and project-driven laboratory experience offer hands-on study of cell culture and protein separation.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

General Core

BIOT 5120	Introduction to Biotechnology	3
BIOT 5631	Cell Culture Processes for Biopharmaceutical Production	3
BIOT 5219	The Biotechnology Enterprise	2
BIOL 6299	Molecular Cell Biology for Biotechnology	3

CHEM 5620	Protein Chemistry	3
PHSC 6214	Experimental Design and Biostatistics	2
BIOT 5130	Team Skills in Biotechnology	2
CHEM 5660	Analytical Biochemistry	3
Co-op		
BIOT 6500	Professional Development for Co-op	0
BIOT 6964	Co-op Work Experience	0

Concentrations

Complete one of the following four concentrations:

- Biopharmaceutical Analytical Sciences Concentration (p. 250)
- Biotechnology Enterprise Concentration (p. 250)
- 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
Elective		3

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
Elective		4

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
Elective		3

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
Elective		3

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 Science, Graduate Certificate

The Graduate Certificate in Biopharmaceutical Analytical Science 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. The certificate offers an opportunity for individuals, particularly those who are working in the various sectors of biotechnology—including basic research of biological systems, discovery, development, and manufacturing of biopharmaceuticals—to enhance their competency and practical skills, enabling 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

Requirements

Complete all courses and requirements listed below unless otherwise indicated.

CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis	3
-----------	--	---

CHEM 5660	Analytical Biochemistry	3
CHEM 5616	Protein Mass Spectrometry	3
CHEM 5617	Protein Mass Spectrometry Laboratory	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

Graduate Coordinator
Jonathan Grabowski, PhD, Associate Professor,
j.grabowski@northeastern.edu

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 in Marine Biology program seeks to prepare students for entry- and mid-level careers in marine research. The doctoral 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. 324)
- Ecology, Evolution, and Marine Biology—Advanced Entry (p. 324)

Master of Science (MS)

- Marine Biology—Three Seas Program (p. 325)

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:

EEMB 7100	Colloquium	1
-----------	------------	---

Approved Graduate-Level Courses

Complete 28 semester hours from the following; 20 semester hours must carry a letter grade:

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	0
-----------	--------------	---

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

Students must complete colloquium twice:

EEMB 7100	Colloquium	1
EEMB 8986	Research	0

Dissertation

Complete the following course twice:

EEMB 9990	Dissertation	0
-----------	--------------	---

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

Summer Term

EEMB 8674	Marine Biology Research Project	1
-----------	---------------------------------	---

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)

Graduate Coordinator
Maxim Braverman, PhD, Professor, m.braverman@northeastern.edu

Graduate Programs Information
www.math.neu.edu/graduate-programs (<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. 326)
- Mathematics—Advanced Entry (p. 329)

Master of Science (MS)

- Applied Mathematics (p. 331)
- Mathematics (p. 331)

Master of Science in Operations Research (MSOR)

- Operations Research (p. 332)

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 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 one-page initial plan
- Completion of a three-page plan of research
- Completion of a ten-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

Track

Complete one of the following three tracks:

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 reading courses are allowed. 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 reading courses are allowed. 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 reading courses are allowed. 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	0
-----------	--------------	---

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 MS 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 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 one-page initial plan
- Completion of a three-page plan of research
- Completion of a ten-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 0–32 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

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 16 semester hours from the advanced course work list. Only two readings and three topics courses are allowed. (p. 330) 16

DISCRETE TRACK**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 16 semester hours from the advanced course work list. Only two reading courses are allowed. (p. 330) 16

PROBABILITY AND STATISTICS TRACK**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 16 semester hours from the advanced course work list. Only two reading courses are allowed. (p. 330) 16

Advanced Course Work List

MATH 7204	Complex Analysis	4
MATH 7213	Algebra 3: Galois Theory	4
MATH 7234	Optimization and Complexity	4
MATH 7301	Functional Analysis	4
MATH 7302	Partial Differential Equations 2	4
MATH 7303	Complex Manifolds	4
MATH 7311	Commutative Algebra	4
MATH 7312	Lie Theory	4
MATH 7313	Representation Theory	4
MATH 7315	Algebraic Number Theory	4
MATH 7316	Lie Algebras	4
MATH 7321	Topology 3	4

MATH 7322	Geometry 3	4
MATH 7323	Differential Geometry 1	4
MATH 7324	Differential Geometry 2	4
MATH 7331	Algebraic Combinatorics	4
MATH 7335	Discrete Geometry 2	4
MATH 7344	Regression, ANOVA, and Design	4
MATH 7345	Nonparametric Methods in Statistics	4
MATH 7346 to MATH 7392		
MATH 7976 to MATH 8986		
MATH 9948	Modern Mathematical Research	4
MATH 9984	Research	1-4
MATH 9986	Research	0
MATH 7721	Readings in Topology	4
MATH 7722	Readings in Algebraic Topology	4
MATH 7723	Readings in Geometric Topology	4
MATH 7725	Readings in Singularities	4
MATH 7730	Readings in Combinatorics	4
MATH 7731	Readings in Combinatorics and Algebra	4
MATH 7732	Readings in Combinatorial Geometry	4
MATH 7733	Readings in Graph Theory	4
MATH 7734	Readings in Algebra	4
MATH 7735	Readings in Algebraic Geometry	4
MATH 7736	Readings in Discrete Geometry	4
MATH 7737	Readings in Commutative Algebra	4
MATH 7741	Readings in Probability and Statistics	4
MATH 7751	Readings: Analysis	4
MATH 7752	Readings in Real Analysis	4
MATH 7753	Readings in Geometric Analysis	4
MATH 7754	Readings in Ordinary Differential Equations	4
MATH 7755	Readings in Partial Differential Equations	4
MATH 7771	Readings in Geometry	4
MATH 7772	Readings in Coding Theory	4

Dissertation

Complete the following (repeatable) course twice:

MATH 9990	Dissertation	0
-----------	--------------	---

Program Credit/GPA Requirements

32 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 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**

MATH 7241	Probability 1	4
or MATH 7341	Probability 2	

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 5200	Database Management Systems	
CS 5800	Algorithms	
EECE 7360	Combinatorial Optimization	
EMGT 5220	Engineering Project Management	
EMGT 6225	Economic Decision Making	
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 7203	Numerical Analysis 1	
MATH 7205	Numerical Analysis 2	
MATH 7232	Combinatorial Analysis	
MATH 7233	Graph Theory	
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	
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

PhysicsWebsite (<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

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. 333)
- Physics—Advanced Entry (p. 335)

Master of Science (MS)

- Physics (p. 338)

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 coursework, 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. 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. 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 secretary 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 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

Complete two of the following: 8

PHYS 7323	Elementary Particle Physics	
PHYS 7324	Condensed Matter Physics	
PHYS 7731	Biological Physics 1	

SPECIALIZATION OPTIONS

Students may elect to pursue one of the following specialization options. Students must have a faculty mentor and preapproval to enroll in the specialization courses.

General Option

Requires 10 semester hours 10

Complete the following:

PHYS 7321	Computational Physics	
PHYS 9984	Advanced Research	

Complete one of the following:

PHYS 7733	Topics: Elementary Particle Physics and Cosmology	
PHYS 7734	Topics: Condensed Matter Physics	
PHYS 7741	Biological Physics 2	

Nanomedicine Option

Requires 10 semester hours 10

NNMD 5270	Introduction to Nanomedicine Science and Technology	
PHYS 9984	Advanced Research	

Network Science Option

Requires 10 semester hours 10

PHYS 9984	Advanced Research	
PHYS 5116	Complex Networks and Applications	
PHYS 7731	Biological Physics 1	
PHYS 9984	Advanced Research	

Dissertation Courses

Complete the following (repeatable) course twice:

PHYS 9990	Dissertation	0
-----------	--------------	---

Then register for the following course every term until graduation:

PHYS 9996	Dissertation Continuation	0
-----------	---------------------------	---

Program Credit/GPA Requirements

42 total semester hours required

Minimum 3.000 GPA required

PhD Specialization Options

By approval of the graduate committee, a specialization in biological physics may take a graduate course in biology, physics, or chemistry from an approved course list instead of Biological Physics 2 (PHYS 7741). Additional appropriate courses may also be substituted by approval of the physics graduate committee.

Students who take Biological Physics 1 (PHYS 7731) and Biological Physics 2 (PHYS 7741) or an approved BIOL or CHEM course will receive a PhD in physics with a biological physics specialization (if it is desired to list a specialization).¹

Students who take Elementary Particle Physics (PHYS 7323) and Topics: Elementary Particle Physics and Cosmology (PHYS 7733) will receive a PhD in physics with a particle physics specialization (if it is desired to list a specialization).¹

Students who take Condensed Matter Physics (PHYS 7324) and Topics: Condensed Matter Physics (PHYS 7734) will receive a PhD in physics with a condensed matter physics specialization (if it is desired to list a specialization).¹

Students who take Complex Networks and Applications (PHYS 5116) and Network Science Data (PHYS 7331) will receive a PhD in physics with a network science specialization (if it is desired to list a specialization).¹

Students who take Introduction to Nanomedicine Science and Technology (NNMD 5270) and Nanomedicine Research Techniques (NNMD 5370) will receive a PhD in physics with a nanomedicine specialization (if it is desired to list a specialization).¹

All other combinations that meet the criteria for graduation result in a general PhD in physics. Multiple specializations are allowed if the individual requirements for each specialization are met.

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.

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 (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 (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 secretary 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	0

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 specialization¹

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.

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)

Rebecca Schachter, Staff Assistant, r.schachter@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. 339)
- Psychology—Advanced Entry (p. 340)

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 proseminar 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					Year 5						
Fall	Hours	Spring	Hours	Summer Full Semester	Hours	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 9996	0	PSYC 9996	0	PSYC 9996	0
PSYC 510I		PSYC 510I									
PSYC 5110		PSYC 5110									
PSYC 512I		PSYC 512I									
PSYC 5130		PSYC 5130									
PSYC 514I		PSYC 514I									
PSYC 5150		PSYC 5150									
PSYC 516I		PSYC 516I									
PSYC 5170		PSYC 5170									
	6		6								
PSYC 5180		PSYC 5181									
PSYC 840		PSYC 840									
	12		12		3						
Year 2					Year 3						
Fall	Hours	Spring	Hours	Summer Full Semester	Hours	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					Year 4						
Fall	Hours	Spring	Hours	Summer Full Semester	Hours	Fall	Hours	Spring	Hours	Summer Full Semester	Hours
PSYC 9990	0	Complete one of the following:	3	PSYC 9996	0	PSYC 9996	0	PSYC 9996	0	PSYC 9996	0
		PSYC 730									
		PSYC 7302									
		Complete the following:	0								
		PSYC 9990									
	0		3		0						
Year 4					Year 5						
Fall	Hours	Spring	Hours	Summer Full Semester	Hours	Fall	Hours	Spring	Hours	Summer Full Semester	Hours
PSYC 9996	0	PSYC 9996	0	PSYC 9996	0	PSYC 9996	0	PSYC 9996	0	PSYC 9996	0
	0		0		0						0

Electives

Complete 11 semester hours of approved psychology electives. At least three electives must be substantive. You may choose outside electives in consultation with your faculty advisor and graduate coordinator. Proseminar courses taken as electives must be in addition to the four courses required above.

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, twelve-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. 374)

College of Social Sciences and Humanities

Graduate Admissions and Student Services (<http://www.northeastern.edu/cssh/graduate/programs>)

Uta G. Poiger, PhD, Dean

Natasha 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, MS, Administrative Coordinator, Graduate Admissions and Student Services

180 Renaissance Park
617.373.5990
617.373.7281 (fax)
gradcssh@northeastern.edu

General Regulations (http://www.northeastern.edu/cssh/graduate/current_students)

Graduate education at Northeastern integrates the highest level of scholarship across disciplinary boundaries with significant research and experiential learning opportunities. This multidimensional learning environment seeks to develop students' critical thinking and creative problem-solving skills while introducing them to new perspectives in their fields. Our doctoral, master's, and professional degree programs seek to produce graduates who are well prepared for the diverse demands of careers in academia, industry, and the professions.

School of Criminology and Criminal Justice

Website (<http://www.northeastern.edu/cssh/sccj>)

James Alan Fox, PhD

Lipman Family Professor and Interim Director

Natasha A. Frost, PhD

Associate Professor, Associate Director, and Graduate Program Director

435 Churchill Hall
617.373.2813
617.373.8998 (fax)
sccj@northeastern.edu

Graduate Programs Contact

Laurie Mastone, Graduate Program Administrator,
l.mastone@northeastern.edu

Graduate Programs Booklet (<http://www.northeastern.edu/cssh/sccj/graduate>)

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.

Programs

Doctor of Philosophy (PhD)

- Criminology and Justice Policy (p. 342)
- Criminology and Justice Policy—Advanced Entry (p. 343)

Master of Science in Criminal Justice (MSCJ)

- Criminal Justice (p. 344)

Graduate Certificate

- Global Criminology (p. 344)

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 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

Bachelor's 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 Requirements

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	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:		
CRIM 9990	Dissertation	0

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 Requirements

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 from the following range:	15
CRIM 7200 to CRIM 7989	

Exam and Dissertation

Exam Preparation

CRIM 8960	Exam Preparation—Doctoral	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:	
---	--

CRIM 9990	Dissertation	0	CRIM 7500	Internship 1	3
-----------	--------------	---	-----------	--------------	---

Program Credit/GPA Requirements

32 total semester hours required
Minimum 3.000 GPA required

Criminal Justice, MSCJ

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 in criminal justice 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 criminal justice may be pursued on either a full- or part-time basis. All candidates for the Master of Science in 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.

Requirements

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

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

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

English

Website (<http://www.northeastern.edu/cssh/english>)

Elizabeth Maddock Dillon, PhD
 Professor and Chair

Theo Davis, PhD
 Associate Professor and Graduate Program Director

405 Lake Hall
 617.373.3692
 617.373.3640 (fax)
gradenglish@northeastern.edu

Graduate Programs Contact
 Melissa Daigle, Graduate Program Administrator,
m.daigle@northeastern.edu

Graduate Programs Booklet (<http://www.northeastern.edu/cssh/english/graduate>)

The graduate program in English encompasses the digital and textual study of British and American literature, literary history and theory, and rhetoric and composition. At Northeastern University, graduate study in English takes full advantage of the opportunities that the greater Boston area affords as the site of rich cultural and educational resources.

Programs

Doctor of Philosophy (PhD)

- English (p. 345)
- English—Advanced Entry (p. 347)

Master of Arts (MA)

- English (p. 348)

Graduate Certificate

- Digital Humanities (p. 350)

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 work 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.

Doctoral Degree Candidacy

Students entering with a relevant BA must complete 42 semester hours, complete the language requirement, and pass the comprehensive examination.

Program Requirements

Bachelor's Degree Entrance

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

- Comprehensive examination
- Annual review
- Two languages
- Dissertation committee
- Dissertation prospectus
- Dissertation defense

Program Requirements

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 5101	Critical Issues
ENGL 7111	Rhetorical Theory
ENGL 7112	Rhetorical Criticism
ENGL 7311	Linguistics
ENGL 7312	Syntax
ENGL 7313	Semantics
ENGL 7321	Topics in Linguistics
ENGL 7322	Linguistics and Literature
ENGL 7323	Linguistics and Writing
ENGL 7324	History of the English Language
ENGL 7325	Issues in English Grammar
ENGL 7326	Gender and Language
ENGL 7331	Film Studies (selected versions of this course)
ENGL 7332	Topics in Film (selected versions of this course)

ENGL 7333	American Film (selected versions of this course)
ENGL 7334	Contemporary Film (selected versions of this course)
ENGL 7341	Contemporary Critical Theory
ENGL 7342	Topics in Criticism
ENGL 7358	Topics in Literature and other Disciplines
ENGL 7370	Topics in Digital Humanities
ENGL 7379	Ethnography
INSH 7910	NULab Project Seminar
WMNS 6100	Theorizing Gender and Sexuality
WMNS 7976	Directed Study (selected versions of this course)

Rhetoric and Composition

Complete 3 semester hours from the following: 3

ENGL 5102	Key Concepts in Rhetoric and Composition
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 7393	Writing and Learning Across Curriculum
ENGL 7394	Writing Programs in Schools and Colleges
ENGL 7395	Topics in Writing
ENGL 7396	Composition Pedagogy
ENGL 7397	Responding to Learners
ENGL 7398	Writing and Reading in Content Areas
ENGL 7603	Designing Teacher Research

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 7332	Topics in Film (selected topics only)
ENGL 7342	Topics in Criticism (selected topics only)
ENGL 7351	Topics in Literary Study (selected topics only)
ENGL 7352	Topics in Genre (selected topics only)
ENGL 7353	Topics in Fiction (selected topics only)
ENGL 7354	Topics in Drama (selected topics only)
ENGL 7355	Topics in Poetry (selected topics only)
ENGL 7356	Topics in Nonfiction Prose (selected topics only)
ENGL 7357	Topics in Literary Relations (selected topics only)

ENGL 7358	Topics in Literature and other Disciplines (selected topics only)
ENGL 7359	Topics in Comparative Literature (selected topics only)

Seventeenth and Eighteenth Century

Complete 3 semester hours from the following: 3

ENGL 7201	Perspectives on American Literature (selected versions of this course)
ENGL 7202	African-American Literature (selected versions of this course)
ENGL 7206	American Literature and Culture 1
ENGL 7211	Topics in American Literature (selected topics only)
ENGL 7212	Topics in African-American Literature (selected topics only)
ENGL 7213	Topics in Early American Literature
ENGL 7263	Seventeenth-Century Literature
ENGL 7264	Restoration and Early Eighteenth-Century Literature
ENGL 7275	Milton
ENGL 7283	Topics in Seventeenth-Century Literature
ENGL 7284	Topics in Eighteenth-Century Literature
ENGL 7291	Eighteenth-Century Novel
ENGL 7332	Topics in Film (selected topics only)
ENGL 7342	Topics in Criticism (selected topics only)
ENGL 7351	Topics in Literary Study (selected topics only)
ENGL 7352	Topics in Genre (selected topics only)
ENGL 7353	Topics in Fiction (selected topics only)
ENGL 7354	Topics in Drama (selected topics only)
ENGL 7355	Topics in Poetry (selected topics only)
ENGL 7356	Topics in Nonfiction Prose (selected topics only)
ENGL 7357	Topics in Literary Relations (selected topics only)
ENGL 7358	Topics in Literature and other Disciplines (selected topics only)
ENGL 7359	Topics in Comparative Literature (selected topics only)

Nineteenth and Twentieth Century

Complete 3 semester hours from the following: 3

ENGL 7201	Perspectives on American Literature (selected versions of this course)
ENGL 7202	African-American Literature (selected versions of this course)
ENGL 7207	American Literature and Culture 2
ENGL 7211	Topics in American Literature (selected topics only)
ENGL 7212	Topics in African-American Literature (selected topics only)
ENGL 7214	Topics in Nineteenth-Century American Literature
ENGL 7215	Topics in Twentieth-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 7225	Individual American Writer (selected versions of this course)
ENGL 7226	Individual Modern American Novelist (selected versions of this course)
ENGL 7231	Nineteenth-Century American Prose, 1820–1865
ENGL 7232	Nineteenth-Century American Prose, 1865–1900
ENGL 7233	Nineteenth-Century American Poetry
ENGL 7241	Modern American Prose
ENGL 7243	Modern American Drama
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 Twentieth-Century British Literature
ENGL 7292	Romantic Poetry
ENGL 7293	Victorian Poetry
ENGL 7294	Victorian Novel
ENGL 7295	Twentieth-Century British Drama
ENGL 7296	Twentieth-Century British Fiction
ENGL 7332	Topics in Film
ENGL 7333	American Film
ENGL 7334	Contemporary Film
ENGL 7341	Contemporary Critical Theory
ENGL 7342	Topics in Criticism (selected topics only)
ENGL 7351	Topics in Literary Study (selected topics only)
ENGL 7352	Topics in Genre (selected topics only)
ENGL 7353	Topics in Fiction (selected topics only)
ENGL 7354	Topics in Drama (selected topics only)
ENGL 7355	Topics in Poetry (selected topics only)
ENGL 7356	Topics in Nonfiction Prose (selected topics only)
ENGL 7357	Topics in Literary Relations (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

Exam and Dissertation

Exam Preparation

ENGL 8960	Exam Preparation—Doctoral	0
-----------	---------------------------	---

Research

Complete the following (repeatable) course twice:		
ENGL 9986	Research	0

Dissertation

Complete the following (repeatable) course twice:		
ENGL 9990	Dissertation	0

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 work 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.

Doctoral Degree Candidacy

Students entering with a relevant MA must complete 21 semester hours, complete the language requirement, and pass the comprehensive examination.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

- Comprehensive examination
- Annual review
- Two languages
- Dissertation committee
- Dissertation prospectus
- Dissertation defense

Program Requirements

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	0
-----------	---------------------------	---

Research

Complete the following (repeatable) course twice:

ENGL 9986	Research	0
-----------	----------	---

Dissertation

Complete the following (repeatable) course twice:

ENGL 9990	Dissertation	0
-----------	--------------	---

Program Credit/GPA Requirements

21 total semester hours required

Minimum 3.500 GPA required

English, MA

The Master of Arts program is designed to give students broad exposure to the current state of English studies. Students in the program have opportunities to take classes in literature, literary studies, linguistics, rhetoric, composition, and digital humanities.

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.

Program Requirements

Milestones

- Comprehensive examination or Thesis
- Annual review
- One language

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Proseminar

ENGL 5103	Proseminar	3
-----------	------------	---

Theories and Methods

Complete 6 semester hours from the following:	6
---	---

ENGL 5101	Critical Issues	
ENGL 7111	Rhetorical Theory	
ENGL 7112	Rhetorical Criticism	
ENGL 7311	Linguistics	
ENGL 7312	Syntax	
ENGL 7313	Semantics	
ENGL 7321	Topics in Linguistics	
ENGL 7322	Linguistics and Literature	
ENGL 7323	Linguistics and Writing	
ENGL 7324	History of the English Language	
ENGL 7325	Issues in English Grammar	
ENGL 7326	Gender and Language	
ENGL 7331	Film Studies (selected versions of this course)	

ENGL 7332	Topics in Film (selected versions of this course)	
ENGL 7333	American Film (selected versions of this course)	
ENGL 7334	Contemporary Film (selected versions of this course)	
ENGL 7341	Contemporary Critical Theory	
ENGL 7342	Topics in Criticism	
ENGL 7358	Topics in Literature and other Disciplines	
ENGL 7370	Topics in Digital Humanities	
ENGL 7379	Ethnography	
INSH 7910	NULab Project Seminar	
WMNS 6100	Theorizing Gender and Sexuality	
WMNS 7976	Directed Study (selected versions of this course)	

Rhetoric and Composition

Complete 6 semester hours from the following:	6
---	---

ENGL 5102	Key Concepts in Rhetoric and Composition	
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 7394	Writing Programs in Schools and Colleges	
ENGL 7395	Topics in Writing	
ENGL 7396	Composition Pedagogy	
ENGL 7397	Responding to Learners	
ENGL 7398	Writing and Reading in Content Areas	
ENGL 7603	Designing Teacher Research	

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 7332	Topics in Film (selected topics only)	
ENGL 7342	Topics in Criticism (selected topics only)	
ENGL 7351	Topics in Literary Study (selected topics only)	
ENGL 7352	Topics in Genre (selected topics only)	
ENGL 7353	Topics in Fiction (selected topics only)	
ENGL 7354	Topics in Drama (selected topics only)	

ENGL 7355	Topics in Poetry (selected topics only)
ENGL 7356	Topics in Nonfiction Prose (selected topics only)
ENGL 7357	Topics in Literary Relations (selected topics only)
ENGL 7358	Topics in Literature and other Disciplines (selected topics only)
ENGL 7359	Topics in Comparative Literature (selected topics only)

Seventeenth and Eighteenth Centuries

Complete 3 semester hours from the following: 3

ENGL 7201	Perspectives on American Literature (selected versions of this course)
ENGL 7202	African-American Literature (selected versions of this course)
ENGL 7206	American Literature and Culture 1
ENGL 7211	Topics in American Literature (selected topics only)
ENGL 7212	Topics in African-American Literature (selected topics only)
ENGL 7213	Topics in Early American Literature
ENGL 7263	Seventeenth-Century Literature
ENGL 7264	Restoration and Early Eighteenth-Century Literature
ENGL 7275	Milton
ENGL 7283	Topics in Seventeenth-Century Literature
ENGL 7284	Topics in Eighteenth-Century Literature
ENGL 7291	Eighteenth-Century Novel
ENGL 7332	Topics in Film (selected topics only)
ENGL 7342	Topics in Criticism (selected topics only)
ENGL 7351	Topics in Literary Study (selected topics only)
ENGL 7352	Topics in Genre (selected topics only)
ENGL 7353	Topics in Fiction (selected topics only)
ENGL 7354	Topics in Drama (selected topics only)
ENGL 7355	Topics in Poetry (selected topics only)
ENGL 7356	Topics in Nonfiction Prose (selected topics only)
ENGL 7357	Topics in Literary Relations (selected topics only)
ENGL 7358	Topics in Literature and other Disciplines (selected topics only)
ENGL 7359	Topics in Comparative Literature (selected topics only)

Nineteenth and Twentieth Centuries

Complete 3 semester hours from the following: 3

ENGL 7201	Perspectives on American Literature (selected versions of this course)
ENGL 7202	African-American Literature (selected versions of this course)
ENGL 7207	American Literature and Culture 2
ENGL 7211	Topics in American Literature (selected topics only)
ENGL 7212	Topics in African-American Literature (selected topics only)

ENGL 7214	Topics in Nineteenth-Century American Literature
ENGL 7215	Topics in Twentieth-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 7225	Individual American Writer (selected versions of this course)
ENGL 7226	Individual Modern American Novelist (selected versions of this course)
ENGL 7231	Nineteenth-Century American Prose, 1820–1865
ENGL 7232	Nineteenth-Century American Prose, 1865–1900
ENGL 7233	Nineteenth-Century American Poetry
ENGL 7241	Modern American Prose
ENGL 7243	Modern American Drama
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 Twentieth-Century British Literature
ENGL 7292	Romantic Poetry
ENGL 7293	Victorian Poetry
ENGL 7294	Victorian Novel
ENGL 7295	Twentieth-Century British Drama
ENGL 7296	Twentieth-Century British Fiction
ENGL 7332	Topics in Film
ENGL 7333	American Film
ENGL 7334	Contemporary Film
ENGL 7341	Contemporary Critical Theory
ENGL 7342	Topics in Criticism (selected topics only)
ENGL 7351	Topics in Literary Study (selected topics only)
ENGL 7352	Topics in Genre (selected topics only)
ENGL 7353	Topics in Fiction (selected topics only)
ENGL 7354	Topics in Drama (selected topics only)
ENGL 7355	Topics in Poetry (selected topics only)
ENGL 7356	Topics in Nonfiction Prose (selected topics only)
ENGL 7357	Topics in Literary Relations (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

ENGL 7990, Thesis, counts as one open elective.

Complete 6 semester hours of ENGL courses. 6

Exam Preparation and Thesis**Exam Preparation**

Required for students who must maintain full-time status while completing the MA comprehensive examination or Thesis.

ENGL 6960 Exam Preparation—Master's 0

Thesis

ENGL 7990 Thesis (minimum 3.500 GPA required) 3

Program Credit/GPA Requirements

30 total semester hours required

Minimum 3.000 GPA required

Digital Humanities, Graduate Certificate

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 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); 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 as 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. The Certificate in Digital Humanities will allow students to pursue an organized course of study in DH 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 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.

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

Repeat the following course three times:

INSH 7910 NULab Project Seminar (Repeatable) 1

Final Project

Complete 3 semester hours from the following: 3

Independent Study or Thesis within student's home program

Elective

Complete 3-4 semester hours from the following: 3-4

ARTG 5100 Information Design Studio 1—Principles

CS 6120 Natural Language Processing

ENGL 7370 Topics in Digital Humanities

HIST 7219 Topics in Cultural History

POLS 7344 Hard Power, Soft Power, and Smart Power

PPUA 6301 Introduction to Computational Statistics 4

Program Credit/GPA Requirements

Minimum 12 total semester hours required

Minimum 3.000 GPA required

HistoryWebsite (<http://www.northeastern.edu/cssh/history>)**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

Graduate Programs Booklet (<http://www.northeastern.edu/cssh/history/graduate/current-student-resources>)

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. 351)
- History—Advanced Entry (p. 351)

Master of Arts (MA)

- History (p. 352)

Graduate Certificate

- Public History (p. 353)

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. Students must pass the qualifying examination by the end of the first semester of the third year in the program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Language
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	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:		
HIST 9990	Dissertation	0

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. Students must pass the qualifying examination by the end of the first semester of the third year in the program.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

Qualifying examination
Annual review
Language
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	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:

HIST 9990	Dissertation	0
-----------	--------------	---

Program Credit/GPA Requirements

31 total semester hours required

Minimum 3.500 GPA required

History, MA

The department offers a Master of Arts in History; students can choose from concentrations in world history and public history.

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.

Public history emphasizes the study of topics such as material culture, historical exhibits and museums, historical agencies, and archival administration.

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

Program pending approval.

Complete all courses and requirements listed below unless otherwise indicated.

Note: The MA in history requires a concentration (world history or public history). Consult your college administrator.

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
HIST 7370	Texts, Maps, and Networks: Readings and Methods for Digital History	3

History Concentration

Complete 3 semester hours from the following range: 3

HIST 7300 to HIST 7700

Electives

Complete 21 semester hours from the following: 21

HIST 7201 European Social History 1650–1850

HIST 5101 to HIST 5295

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
-----------	--------------------------	---

Digital History

HIST 7370	Texts, Maps, and Networks: Readings and Methods for Digital History	3
-----------	---	---

Public History

HIST 5237	Issues and Methods in Public History	3
-----------	--------------------------------------	---

History

Group 1

Complete 6 semester hours from the following: 6

HIST 5240 to HIST 5295

HIST 7216 to HIST 7223

HIST 7231 to HIST 7238

HIST 7250 Topics in Public History

Group 2

Complete 3 semester hours from the following range: 3

HIST 7301 to HIST 7700

Fieldwork

HIST 8410	Fieldwork in History 1	3
-----------	------------------------	---

Electives

Complete 12 semester hours from the following: 12

HIST 7201 European Social History 1650–1850

HIST 5101 to HIST 5295

HIST 7205 to HIST 7218

HIST 7220 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

HIST 5237	Issues and Methods in Public History	3
HIST 8410	Fieldwork in History 1	3
Complete two electives from 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>)

John Portz, PhD, Professor and Interim Chair

Graduate Program Directors

Denis J. Sullivan, PhD

PhD and MA Programs

Daniel Aldrich, PhD, and Stephen E. Flynn, PhD

MS Security and Resilience Studies Program

Graduate Programs Contact

Logan Wangsgard, Graduate Program Administrator,
l.wangsgard@northeastern.edu

903 Renaissance Park
617.373.4404
617.373.5311 (fax)
gradpolisci@northeastern.edu

Graduate Programs Booklet (<http://www.northeastern.edu/cssh/polisci/programs>)

Graduate training in political science seeks to prepare students to analyze the most important issues in world affairs and to prepare students for 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. 353)
- Political Science, PhD—Advanced Entry (p. 354)

Master of Arts (MA)

- Political Science (p. 355)

Master of Public Administration (MPA)

- Public Administration (p. 357)

Master of Science (MS)

- Security and Resilience Studies (p. 358)

Graduate Certificate

- Security and Resilience Studies (p. 359)

Political Science, PhD

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 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)
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	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:		
POLS 9990	Dissertation	0
POLS 9996	Dissertation Continuation (Taken until completion of program, after 1 year of POLS 9990)	0

Program Credit/GPA Requirements

48 total semester hours required
Minimum 3.500 GPA required

Political Science, PhD—Advanced Entry

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 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)
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 or LPSC 7215	Advanced Quantitative Techniques	3

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.

Specific Elective

POLS 8982	Readings	1-4
-----------	----------	-----

General Electives

Complete 0–12 semester hours from the following:	0-12
POLS 7200 to POLS 7978	

Exam and Dissertation

Exam Preparation

POLS 8960	Exam Preparation—Doctoral	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:		
POLS 9990	Dissertation	0
POLS 9996	Dissertation Continuation (Taken until completion of program, after 1 year of POLS 9990)	0

Program Credit/GPA Requirements

6–30 total semester hours required
Minimum 3.500 GPA required

Political Science, MA

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. 355)
- International Relations (p. 356)
- Comparative Politics (p. 356)
- Public Policy (p.)

Electives

Complete 15 semester hours from 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

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 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

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

Complete 15 semester hours from the Course List. (p. 357)	15
---	----

INTERNSHIP COMPLETED FOR COURSE CREDIT

Internship

PPUA 6407	Internship in Public Policy and Urban Affairs	3
-----------	---	---

Electives

Complete 12 semester hours from the Course List. (p. 357)	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 in the core courses and overall required

Security and Resilience Studies, MS

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, cyber-attacks, 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. Course work is divided between 12 credits in core courses required of all MS students, 12 elective credits within a chosen specialization, and a 6-credit capstone course (with some experiential component). These requirements are described in more detail under the Program Requirements tab. 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 a 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 12 elective credits.

Academic Standing/Progress

Satisfactory progress in the MS program includes maintaining a grade-point average of 3.000. Students must attain a final cumulative GPA of at least 3.000 in all course work, as well as a 3.000 in all five core requirements (including capstone) to qualify for the Master of Science degree.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

General Requirements

Security and Resilience Policy

POLS 7341	Security and Resilience Policy	3
-----------	--------------------------------	---

POLS 7342	Security and Resilience Studies Toolkit	1
Security		
POLS 7347	Controversial Issues in Security Studies	1
POLS 7369	International Security	3
Critical Infrastructure		
POLS 7704	Critical Infrastructure Resilience	4

Specializations

Complete one of the following specializations:

- Administration, Management, and Policy (p. 358)
- Counterterrorism and Conflict Studies (p. 358)
- Cybersecurity Policy (p. 358)
- Resilient Cities (p. 359)

Capstone

Requires 6 semester hours:

POLS 7980	Capstone Project	6
-----------	------------------	---

SPECIALIZATION IN ADMINISTRATION, MANAGEMENT, AND POLICY

Complete 12 semester hours from the following: 12

POLS 7202	Quantitative Techniques	
PPUA 6506	Techniques of Policy Analysis	
PPUA 6503	Public Personnel Administration	
PPUA 6504	Organizational Theory and Management	
PPUA 6505	Public Budgeting and Financial Management	
PPUA 6502	Economic Institutions and Analysis	
PPUA 6507	Institutional Leadership and the Public Manager	

SPECIALIZATION IN COUNTERTERRORISM AND CONFLICT STUDIES

Complete 12 semester hours from the following: 12

CRIM 7242	Terrorism and International Crime	
SOCL 7231	Sociology of Prejudice and Violence	
POLS 7343	Counterterrorism	
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	

SPECIALIZATION IN CYBERSECURITY POLICY

Complete 12 semester hours from the following: 12

IA 5001	Cyberspace Technology and Applications	
IA 5010	Foundations of Information Assurance	
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

SPECIALIZATION IN RESILIENT CITIES

Complete 12 semester hours from the following: 12

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 Twenty-First 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
LPSC 7312	Cities, Sustainability, and Climate Change

Program Credit/GPA Requirements

30 total semester hours required
Minimum 3.000 GPA required

Security and Resilience Studies, Graduate Certificate

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
POLS 7441	Cyberconflict in the International System	3

Elective

Complete 3 semester hours from the following: 3		
POLS 7346	Resilient Cities	
POLS 7369	International Security	
POLS 7442	Homeland Security and Resilience Law and Policy	

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 Booklet (<http://www.northeastern.edu/cssh/economics/graduate/current-student-resources-and-forms>)

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.

The PhD program is a small and focused one. Students may concentrate in either industrial organization, competition policy, regulatory economics, or labor economics. Each field is covered in two semester-long courses. Students who elect the industrial organization, competition

policy, and regulatory economics field may further elect a second field in transportation economics.

Programs

Doctor of Philosophy (PhD)

- Economics (p. 360)
- Economics—Advanced Entry (p. 360)

Master of Arts (MA)

- Economics (p. 361)

Economics, PhD

The PhD program is a small and focused one, specializing in industrial organization, competition policy, regulatory economics, and labor economics. Admission from the bachelor's level requires taking the MA core courses and two additional elective courses plus the PhD requirements. The program requirements shown here are for those students entering the PhD program directly from a bachelor's program.

Doctoral Degree Candidacy

Degree candidacy is attained following satisfactory completion of the required 48 credits of course work, passing qualifying examinations in microeconomics and macroeconomics, passing a field comprehensive examination, and meeting the other program requirements as shown on the program requirements page.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

- Two qualifying examinations—microeconomics and macroeconomics
- Field comprehensive examination
- Annual review
- Dissertation committee
- Dissertation proposal
- Dissertation defense
- Field lunch participation
- Practical experience
- Seminar series participation

Core 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

ECON 7763	Labor Market Analysis	4
or ECON 7771	Framework of Industrial Organization	
ECON 7764	Topics in Labor Economics	4

or ECON 7772 Public Policy Toward Business

Electives

Complete 12 semester hours from the following:	12
ECON 7200 to ECON 7299	
ECON 7976	Directed Study
ECON 8982	Readings

Exam and Dissertation

Exam Preparation

ECON 8960	Exam Preparation—Doctoral	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:		
ECON 9990	Dissertation	0

Program Credit/GPA Requirements

- 48 total semester hours required
- Minimum 3.000 GPA required

Economics, PhD—Advanced Entry

The PhD program is a small and focused one, specializing in industrial organization, competition policy, regulatory economics, and labor economics. The program requirements page shows requirements for those students entering the PhD program with a master's degree. If the master's degree is not in economics, additional course work may be required in order to meet course prerequisites.

Doctoral Degree Candidacy

Degree candidacy is attained following satisfactory completion of the required 24 credits of course work, passing qualifying examinations in microeconomics and macroeconomics, passing a field comprehensive examination, and meeting the other program requirements as shown on the program requirements page.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Milestones

- Two qualifying examinations—microeconomics and macroeconomics
- Field comprehensive examination
- Annual review
- Dissertation committee
- Dissertation proposal
- Dissertation defense
- Field lunch participation
- Practical experience
- Seminar series participation

Core 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

ECON 7763	Labor Market Analysis	4
-----------	-----------------------	---

or ECON 7771	Framework of Industrial Organization	
ECON 7764	Topics in Labor Economics	4
or ECON 7772	Public Policy Toward Business	

Elective Course

Complete 4 semester hours from the following:		4
ECON 7200 to ECON 7299		
ECON 7976	Directed Study	
ECON 8982	Readings	

Exam and Dissertation**Exam Preparation**

ECON 8960	Exam Preparation—Doctoral	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:		
ECON 9990	Dissertation	0

Program Credit/GPA Requirements

- 24 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.

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

Complete 16 semester hours from the following range:		16
ECON 5200 to ECON 7772		

Program Credit/GPA Requirements

- 32 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

Laurie Dopkins, PhD
Director of Academic Programs

Certificate Program, Nonprofit Sector, Philanthropy, and Social Change

Graduate Program Directors**Alan Clayton-Matthews, PhD**

PhD Program, Law and Public Policy

Christopher Bosso, PhD

JD/MS Program, Law and Public Policy

MPP Program

Certificate Program, Public Policy Analysis

Amílcar Antonio Barreto, JD, PhD

MA Program, International Affairs

Thomas J. Vicino, PhD

MPA Program

Matthias Ruth, PhD

MS Program, Urban Informatics

Certificate Program, Urban Informatics

Gavin Shatkin, PhD

MS Program, Urban and Regional Policy

Certificate Program, Urban Studies

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

Graduate Programs Booklet (<http://catalog.northeastern.edu/graduate/social-sciences-humanities/public-policy-urban-affairs/%20http://www.northeastern.edu/cssh/policyschool/graduate-programs>)

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. 362)
- Law and Public Policy—Advanced Entry (p. 363)

Master of Arts (MA)

- International Affairs (p. 363)

Master of Public Administration (MPA)

- Public Administration (p. 357)

Master of Public Policy (MPP)

- Public Policy (p. 366)

Master of Science (MS)

- Urban Informatics (p. 367)
- Urban and Regional Policy (p. 367)

Graduate Certificates

- Public Policy Analysis (p. 368)
- Nonprofit Sector, Philanthropy, and Social Change (p. 368)
- Urban Informatics (p. 369)
- Urban Studies (p. 369)

Dual degree

- Law and Public Policy, JD/MS (p. 369)

Law and Public Policy, PhD

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 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
 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 Twenty-First 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	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:

LPSC 9990	Dissertation	0
-----------	--------------	---

Program Credit/GPA Requirements

42 total semester hours required
Minimum 3.500 GPA required

Law and Public Policy, PhD—Advanced Entry

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 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
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	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:		
LPSC 9990	Dissertation	0

Program Credit/GPA Requirements

36 total semester hours required
Minimum 3.500 GPA required

International Affairs, MA

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 MA 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—democratization, globalization, 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 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	

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	Twentieth-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 Electives¹

Complete 12 semester hours from the following: 12

CRIM 7201	Global Criminology	
CRIM 7336	Globalization of Crime and Justice	
HIST 7227	Twentieth-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.

Tracks

Complete one of the following tracks:

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 7221	Globalization, Development, and Social Justice
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

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 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

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

Complete 15 semester hours from the Course List. (p. 357) 15

INTERNSHIP COMPLETED FOR COURSE CREDIT

Internship

PPUA 6407	Internship in Public Policy and Urban Affairs	3
-----------	---	---

Electives

Complete 12 semester hours from the Course List. (p. 357) 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 in the core courses and overall required

Public Policy, MPP

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 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 6509	Techniques of Program Evaluation	3
PPUA 6205	Research Design and Methodology in Urban and Regional Policy	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 OR COMPLETED NOT FOR COURSE CREDIT

Complete 12 semester hours from the course list below. 12

INTERNSHIP COMPLETED FOR COURSE CREDIT

Internship

PPUA 6407	Internship in Public Policy and Urban Affairs	3
-----------	---	---

Electives

Complete 9 semesters hours from the course list below. 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

The 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 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

DS 6020		4
DS 6030		4
PPUA 6301	Introduction to Computational Statistics	4
PPUA 6302	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

Complete the urban portfolio course (pending approval).

1

Program Credit/GPA Requirements

32 total semester hours required

Minimum 3.000 GPA required

Urban and Regional Policy, MS

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 Twenty-First 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 6216

Capstone		
PPUA 7673	Capstone in Public Policy and Urban Affairs	3

Internship Requirement

An approved internship or waiver is required.

INTERNSHIP WAIVED OR COMPLETED NOT FOR COURSE CREDIT

Complete 15 semester hours from the Course List. 15

INTERNSHIP COMPLETED FOR COURSE CREDIT

Internship		
PPUA 6407	Internship in Public Policy and Urban Affairs	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

The Graduate Certificate in Public Policy Analysis seeks to provide students in a variety of graduate programs 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 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

Complete all courses and requirements listed below unless otherwise indicated.

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

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 as approved by the program director. A sample list of electives includes:		6
HUSV 5200	Strategic Communications for Nonprofit Organizations	

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 7243	International Development Administration and Planning

Program Credit/GPA Requirements

12 total semester hours required
 Minimum 3.000 GPA required

Urban Informatics, Graduate Certificate

With seventy-five 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 Informatics seeks to prepare students 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 informatics 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 policy-making processes. Students cultivate applied skills in visual presentation, analysis, and modeling of new data sets—all of which helps to inform investment and policy making. 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 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

The Graduate Certificate in Urban Studies provides a foundation in the fundamentals of urban and regional policy theory and research methods and culminates in an applied capstone project. 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 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

Complete the following 6 semester hours:		6
PPUA 6201	The Twenty-First Century City: Urban Opportunities and Challenges in a Global Context	
PPUA 7673	Capstone in Public Policy and Urban Affairs	

Methods and Research Elective

Complete 3 semester hours from the following:		3
PPUA 6205	Research Design and Methodology in Urban and Regional Policy	
PPUA 6206 to PPUA 6216		

Elective

Complete 3 semester hours from the following:		3
PPUA 5000 to PPUA 6999		

Program Credit/GPA Requirements

12 total semester hours required
 Minimum 3.000 GPA required

Law and Public Policy, JD/MS

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.

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 or POLS 7202	Research and Statistical Methods Quantitative Techniques	3
---------------------------	---	---

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

Linda M. Blum, 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 (j.collins@northeastern.edu)

Graduate Programs Booklet (<http://www.northeastern.edu/cssh/socant/graduate/current-student-resources>)

Uncertainty about the economy, health care, 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. 370)
- Sociology—Advanced Entry (p. 372)

Master of Arts (MA)

- Sociology (p. 374)

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 Kitty and Michael Dukakis Center for Urban and Regional Policy (<http://www.northeastern.edu/dukakiscenter>); the Institute for Urban Health Research (<http://www.northeastern.edu/iuhrp>); the Northeastern 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.

A minimum of 24 semester hours of graduate work beyond the master's degree is required.

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

Additional Course

Complete 3 additional semester hours chosen in consultation with your faculty advisor.	3
--	---

Electives

Complete 36 semester hours from the following subject area:	36
SOCL	

Exam and Dissertation

Exam Preparation

SOCL 8960	Exam Preparation—Doctoral	0
-----------	---------------------------	---

Dissertation

Complete the following (repeatable) course twice:		
SOCL 9990	Dissertation	0

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>); Kitty and Michael Dukakis Center for Urban and Regional Policy (<http://www.northeastern.edu/dukakiscenter>); the Institute for Urban Health Research (<http://www.northeastern.edu/iuhrp>); Northeastern 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	
SOCL 7220	Seminar in Qualitative Analysis	
POLS 7215	Advanced Quantitative Techniques	
CRIM 7316	Advanced Topics in Methods	
CRIM 7715	Multivariate Analysis 1	
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 from the following subject area:	15
SOCL	

Exam and Dissertation

Exam Preparation		
SOCL 8960	Exam Preparation—Doctoral	0

Dissertation

Complete the following (repeatable) course twice:

SOCL 9990	Dissertation	0
-----------	--------------	---

Program Credit/GPA Requirements

24 total semester hours required

Minimum 3.000 GPA required

Sociology, MA

The flexible, stand-alone 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 is designed to afford students the opportunity to forge close working relationships with the faculty. Top applicants to the MA program are eligible for funding in the form of College of Social Sciences and Humanities Dean's Scholarships; the program is shorter and culminates in a master's paper that must be approved by two faculty members. The MA program 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.

Milestone

MA paper

Annual review

Requirements**Foundations**

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
-----------	----------------------------------	---

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. 374)

Graduate Certificate

- Data Analytics (p. 100)
- Digital Humanities (p. 350)
- Women's, Gender, and Sexuality Studies (p. 376)

Network Science, PhD**Alessandro Vespignani, PhD**

Sternberg Distinguished Professor and Director for the Network Science Program

Network Science Program

056 Holmes Hall

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.

Qualifying Examination

The qualifying examination consists of a two-part exam conducted by the Qualifying Examination and Dissertation Committee. The technical component of the exam is fulfilled when the student passes the comprehensive exam (see below), normally expected to be completed the spring semester of the second year. The research core of the qualifying exam is fulfilled with the acceptance of a high-quality paper to a strong peer-reviewed conference or journal. This might happen anytime during the PhD program but at least one year prior to the dissertation defense. Students who fail to complete the two-part 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.

Degree Candidacy

A student is considered a PhD degree candidate upon completion of required course work with a minimum GPA of 3.000 overall in all courses and satisfactory completion of the two-part qualifying examination.

Comprehensive Examination

Students must submit a written dissertation proposal to the Qualifying Examination and Dissertation Committee. The proposal should identify 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
Dissertation committee
First author publication
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	4
CS 6220	Data Mining Techniques	4
CS 6240	Parallel Data Processing in MapReduce	4
CS 7800	Advanced Algorithms	4
NETS 7341	Network Economics	4

POLITICAL SCIENCE

POLS 7200	Perspectives on Social Science Inquiry	3
POLS 7201	Research Design	3
POLS 7202	Quantitative Techniques	3
NETS 7341	Network Economics	4

Additional courses TBA.

EPIDEMIOLOGY

PHTH 5202	Epidemiology	3 or 4
PHTH 5224	Social Epidemiology	3
PHTH 5240	Evaluating Scientific Evidence	3
NETS 7341	Network Economics	4

Additional courses TBA.

ENGINEERING

EECE 7200	Linear Systems Analysis	4
EECE 7204	Applied Probability and Stochastic Processes	4
EECE 7323	Numerical Optimization Methods	4
EECE 7374	Fundamentals of Computer Networks	4
NETS 7341	Network Economics	4

PHYSICS

PHYS 7305	Statistical Physics	4
PHYS 5318	Principles of Experimental Physics	4

PHYS 7321	Computational Physics	4
PHYS 7731	Biological Physics 1	4
MATH		
MATH 7241	Probability 1	4
MATH 7233	Graph Theory	4
MATH 7375	Topics in Topology	4
MATH 7733	Readings in Graph Theory	4
NETS 7341	Network Economics	4

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 policy-making 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

DS 6020		4
DS 6030		4
PPUA 6301	Introduction to Computational Statistics	4
PPUA 6302	Information Design and Visual Analytics	4

Program Credit/GPA Requirements

16 total semester hours required

Minimum 3.000 GPA required

Digital Humanities, Graduate Certificate

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 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); 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 as 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. The Certificate in Digital Humanities will allow students to pursue an organized course of study in DH 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 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.

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

Repeat the following course three times:

INSH 7910	NULab Project Seminar (Repeatable)	1
-----------	------------------------------------	---

Final Project

Complete 3 semester hours from the following: 3

Independent Study or Thesis within student's home program

Elective

Complete 3-4 semester hours from the following: 3-4

ARTG 5100	Information Design Studio 1—Principles	
CS 6120	Natural Language Processing	
ENGL 7370	Topics in Digital Humanities	
HIST 7219	Topics in Cultural History	
POLS 7344	Hard Power, Soft Power, and Smart Power	
PPUA 6301	Introduction to Computational Statistics	4

Program Credit/GPA Requirements

Minimum 12 total semester hours required

Minimum 3.000 GPA required

Women's, Gender, and Sexuality Studies, Graduate Certificate

The Graduate Certificate in Women's, Gender, and Sexuality Studies (WGSS) is a supplementary program 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

Certificate students will work with an advisor in their primary or a closely related discipline to develop a plan for completing the certificate. The advisory relationship is intended to be facilitative; students are free to request a different advisor at any time.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Requirements

Required Course Work

Complete 3 semester hours from the following: 3

WMNS 6100 Theorizing Gender and Sexuality

WMNS 7615 Feminist Inquiry

WMNS 7100 Queer Theory: Sexualities, Genders, Politics

Electives

Complete 9 semester hours from the following: 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 7100 Queer Theory: Sexualities, Genders, Politics

SOCL 7202 Feminist Theory

SOCL 7212 Feminist Methodologies

SOCL 7222 Gender and Globalization

SOCL 7225 Gender and Social Movements

SOCL 7236 The Family

SOCL 7237 Women, Men, and Social Change

SOCL 7242 Family Violence

SOCL 7248 Race, Gender, Class: Feminist View

SOCL 7265 Sociology of Gender

SOCL 7273 Gender and Social Policy

WMNS 6100 Theorizing Gender and Sexuality

WMNS 7100 Queer Theory: Sexualities, Genders, Politics

WMNS 7615 Feminist Inquiry

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

Program Credit/GPA Requirements

12 total semester hours required

Minimum 3.000 GPA required

A**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

B**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

C**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

D**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

E**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 Erdogan

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

F**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

G**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

H

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 Hartevelde

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

I**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

J**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

K**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 Kiani

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

L**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. Lefkowitz

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

M

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 Louisiana, 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

Academic Specialist, Entrepreneurship and Innovation; University of Louisville, PhD

Nancy Mizzoni

Clinical Instructor, Nursing; Northeastern University, MS

Anahit Mkrtychyan

Assistant Professor, Finance; Pennsylvania State University, PhD

Valentine 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

N**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 Dichiaccio Faculty Fellow, Supply Chain and Information Management; Michigan State University, PhD

O

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

P**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 Pearlmuter

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

Q

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

R

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

S

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

Cynthia 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 Senior

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 Connecticut, 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. Suci

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 Szaier

Dennis Picard Trustee Professor, Electrical and Computer Engineering; University of Washington, PhD

T**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

U

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

V

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

W**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-Durán

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 Wicks

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

X

Yu (Amy) Xia

Associate Professor, Supply Chain and Information Management; Washington State University, PhD

Y

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

Z**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. Zarembo

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

Nathaniel 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

- Governing Boards and Officers of Northeastern (p. 414)
- University Leadership (p. 415)
- Statements of Accreditation (p. 416)
- Institutional Calendars and Online Resources (p. 418)
- General Information (p. 418)

Governing Boards and Officers of Northeastern

Officers of the Corporation and Board of Trustees 2016–2017

Henry J. Nasella, *Chair*
 Richard A. D'Amore, *Vice 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
 Edmond J. English
 Spencer T. Fung
 Edward G. Galante
 Lucian Grainge CBE
 David L. House
 William S. Howard
 Frances N. Janis
 Chet Kanojia
 Venetia G. Kontogouris
 William A. Lowell
 Todd M. Manganaro
 Katherine S. McHugh
 Alan S. McKim
 David J. Mondragon
 Henry J. Nasella
 Anita Nassar
 Kathryn M. Nicholson

James J. Pallotta
 John V. Pulichino
 Marcy L. Reed
 Winslow L. Sargeant
 Ronald L. Sargent
 Sy Sternberg
 Melina Travlos
 Joseph M. Tucci
 Christopher A. Viehbacher
 Arthur W. Zafiropoulo
 Michael J. Zamkow

EX-OFFICIO

Joseph E. Aoun
 George D. Behrakis

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
 Ruth S. Felton
 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

Other Members of the Corporation

Salah Al-Wazzan
 Quincy L. Allen
 Tarek As'ad
 Robert J. Awkward
 Vincent F. Barletta
 Richard L. Bready
 John F. Burke
 Louise Firth Campbell
 Lawrence G. Cetrulo
 Nassib G. Chamoun
 William D. Chin
 Steven J. Cody
 Daniel T. Condon
 Timothy J. Connelly
 Richard J. DeAgazio
 Kevin A. DeNuccio
 Robin W. Devereux
 Priscilla H. Douglas
 Adriane J. Dudley
 Gary C. Dunton
 Michael J. Egan
 Lisa D. Foster
 Michael F. Gries
 Nancy E. B. Haynes
 Manuel A. Henriquez
 Charles C. Hewitt III
 Roderick Ireland
 Lisette C. Jetzer
 Karen C. Koh
 Mark A. Krentzman
 Mary Kay Leonard
 M. Benjamin Lipman
 George A. MacConnell
 Susan B. Major
 Paul V. McDonough
 Thomas P. McDonough
 Kathleen A. McFeeters
 Susan A. Morelli
 James Q. Nolan Jr.
 Peter J. Ogren
 Lawrence A. O'Rourke
 Leonard Perham
 Valerie W. Perlowitz
 Steven Picheny
 John E. Pritchard
 Eugene M. Reppucci Jr.
 Rhondella Richardson
 David J. Ryan
 George P. Sakellaris
 Jeannine P. Sargent
 Richard Schoenfeld
 Peter J. Smail
 Shelley Stewart Jr.
 Alexander L. Thorndike
 Gordon O. Thompson
 Mark L. Vachon
 Laurie B. Werner
 E. Leo Whitworth
 Donald K. Williams Jr.
 Donald L. Williams

Richard R. Yuse

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

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 (<http://www.northeastern.edu/online/about-northeastern-online/state-agreements.php>) for up-to-date, state-prescribed regulatory information.

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.

3-D Animation, Graduate Certificate	300	Bill Payment	23
Absenteeism	81	Bioengineering	107
Academic Calendars	25	Bioengineering, MSBioE	116
ACADEMIC INTEGRITY	81	Bioengineering, PhD	107
Academic Policies and Procedures	40	Bioengineering, PhD—Advanced Entry	114
Academic Policies and Procedures	81	Bioinformatics, MS	319
Academic Policies and Procedures	102	Bioinformatics, MS—ALIGN Program	320
Academic Policies and Procedures	206	Biology	318
Academic Policies and Procedures	257	Biology, PhD	318
Academic Policies and Procedures	316	Biology, PhD—Advanced Entry	319
Academic Probation Policy	208	Biomedical Nanotechnology, MS	240
Academic Progression	208	Biomedical Sciences, MS	240
Academic Progression Standards	262	Biomedical Sciences, PhD	235
Academic Resources	14	Biopharmaceutical Analytical Science, Graduate Certificate	252
Academic Resources	258	Biopharmaceutical Analytical Science, Graduate Certificate	252
Academic Standards and Degree Requirements	105	Biopharmaceutical Domestic Regulatory Affairs, Graduate Certificate	303
Accommodations for Students with Disabilities	264	Biotechnology, MS	249
Accounting and Financial Decision Making, Graduate Certificate	74	Biotechnology, MS	249
Accounting, MSA	61	Bouvé College of Health Sciences	206
Active-Duty Military Personnel	260	Broadband Wireless Systems, Graduate Certificate	204
Administrative Procedures	106	Business Administration, Graduate Certificate	75
Admission Requirements	102	Business Administration, MBA—Evening/Part-Time Program	66
Adult and Organizational Learning, Graduate Certificate	301	Business Administration, MBA—Full-Time Program	64
Advanced Study of Orthopedics, Graduate Certificate	301	Business Administration, MBA—Online Program	69
Aging, Graduate Certificate	252	Business Administration—Online Program, Graduate Certificate	76
Appeals Policies and Procedures	30	Business Analytics, MS	59
Appendix	414	Campus Recreation	16
Applied Behavior Analysis, CAGS	211	Campus Resources	16
Applied Behavior Analysis, Graduate Certificate	215	Career Services	16
Applied Behavior Analysis, MS	212	Center for Advancing Teaching and Learning Through Research	16
Applied Mathematics, MS	331	Changes in Requirements	317
Applied Nutrition, MS	278	Chemical Engineering	119
Applied Psychology	208	Chemical Engineering, MSCHE	122
Art + Design	47	Chemical Engineering, PhD	119
Arts Administration and Cultural Entrepreneurship, Graduate Certificate	50	Chemical Engineering, PhD—Advanced Entry	120
Attendance Requirements	258	Chemistry and Chemical Biology	321
Audiology, AuD	216	Chemistry, MS	323
Awards	316	Chemistry, PhD	321
Background Checks	207	Chemistry, PhD—Advanced Entry	322
		Civil and Environmental Engineering	124

Civil Engineering, PhD	124	Course Waiver	207
Civil Engineering, PhD—Advanced Entry	125	Criminal Justice, MS	280
Civil Engineering with Concentration in Construction Management, MSCivE	126	Criminal Justice, MSCJ	344
Civil Engineering with Concentration in Environmental and Water Systems, MSCIVE	128	Criminology and Justice Policy, PhD	342
Civil Engineering with Concentration in Geotechnical/Geoenvironmental Engineering, MSCivE	129	Criminology and Justice Policy, PhD—Advanced Entry	343
Civil Engineering with Concentration in Structural Engineering, MSCivE	130	D'Amore-McKim School of Business	59
Civil Engineering with Concentration in Transportation, MSCivE	132	Data Analytics Engineering, MS	185
Code of Student Conduct	30	Data Analytics, Graduate Certificate	100
College Expenses	20	Data Analytics, Graduate Certificate	100
College of Arts, Media and Design	40	Data Mining Engineering, Graduate Certificate	177
College of Computer and Information Science	81	Data Science, MS	85
College of Engineering	102	Degrees, Majors, and Concentrations	263
College of Professional Studies	257	Digital Humanities, Graduate Certificate	350
College of Science	316	Digital Humanities, Graduate Certificate	350
College of Social Sciences and Humanities	342	Digital Media Management, Graduate Certificate	302
College Student Development and Counseling, MS	213	Digital Media, MPS	274
Collegiate Athletics Administration, Graduate Certificate	301	Digital Video, Graduate Certificate	302
Commerce and Economic Development, MS	278	Disability Resource Center	17
Communication Sciences and Disorders	216	Disability Studies, Graduate Certificate	244
Completing Degree Requirements	262	Doctoral Degree Programs	265
Computer Engineering, PhD	141	Dual Degrees	70
Computer Engineering, PhD—Advanced Entry	141	e-Learning and Instructional Design, Graduate Certificate	303
Computer Science	82	Early Intervention, Graduate Certificate	215
Computer Science, Graduate Certificate	89	Early Intervention, Graduate Certificate	215
Computer Science, MSCS	87	Ecology, Evolution, and Marine Biology, PhD	324
Computer Science, MSCS—ALIGN Program	88	Ecology, Evolution, and Marine Biology, PhD—Advanced Entry	324
Computer Science, PhD	82	Economics	359
Computer Science, PhD—Advanced Entry	85	Economics, MA	361
Computer Systems Engineering	137	Economics, PhD	360
Computer Systems Engineering, Graduate Certificate	139	Economics, PhD—Advanced Entry	360
Computer Systems Engineering with Concentration in Software Design Engineering, MSCSE	138	Education, EDD	265
Construction Management, Graduate Certificate	302	Education, MEd	272
Cooperative Education Policies	102	Electrical and Computer Engineering	139
Corporate and Organizational Communication, MS	279	Electrical and Computer Engineering Leadership, MSECCEL	157
Corporate Finance, Graduate Certificate	77	Electrical and Computer Engineering with Concentration in Communications, Control, and Signal Processing, MSECE	142
Corporate Renewal, Graduate Certificate	77	Electrical and Computer Engineering with Concentration in Computer Networks and Security, MSECE	146
Counseling Psychology, CAGS	212	Electrical and Computer Engineering with Concentration in Computer Systems and Software, MSECE	144
Counseling Psychology, MSCP	213	Electrical and Computer Engineering with Concentration in Computer Vision & Machine Learning, MSECE	149
Counseling Psychology, PhD	209	Electrical and Computer Engineering with Concentration in Electromagnetics, Plasma, and Optics, MSECE	151
Course Registration	316		
Course Registration and Withdrawal	104		

Electrical and Computer Engineering with Concentration in Microsystems, Materials, and Devices, MSECE	153	General Information	40
Electrical and Computer Engineering with Concentration in Power Systems, MSECE	155	General Information	418
Electrical Engineering, PhD	141	General Regulations	32
Electrical Engineering, PhD—Advanced Entry	142	General Regulations and Requirements for Interdisciplinary Graduate Degrees	11
Energy Systems	158	General Regulations and Requirements for Nondegree Certificate Programs	9
Energy Systems, Graduate Certificate	161	General Regulations and Requirements for the Certificate of Advanced Graduate Study	10
Energy Systems Graduate Certificates	160	General Regulations and Requirements for the Master's Degree	9
Energy Systems Management, Graduate Certificate	161	General Regulations and Requirements for the Research Doctorate (PhD and EdD)	10
Energy Systems, MS	159	Geographic Information Systems, Graduate Certificate	304
Engineering and Public Policy with Concentration in Energy & Environment, MS	133	Geographic Information Technology, MPS	275
ENGINEERING AND PUBLIC POLICY WITH CONCENTRATION IN INFRASTRUCTURE RESILIENCE, MS	134	Global Criminology, Graduate Certificate	344
Engineering Business, Graduate Certificate	167	Global Partnership Programs	264
Engineering Economic Decision Making Graduate Certificate	168	Global Student Mobility, Graduate Certificate	305
Engineering Leadership, Graduate Certificate	163	Global Studies and International Relations, Graduate Certificate	305
Engineering Management	164	Global Studies and International Relations, MS	283
Engineering Management, Graduate Certificate	167	Gordon Institute of Engineering Leadership	162
Engineering Management Graduate Certificates	167	Governing Boards and Officers of Northeastern	414
Engineering Management, MSEM	165	Grading	207
English	345	Grading Policies	316
English, MA	348	Graduate Campus	264
English, PhD	345	Graduate Certificate Programs	74
English, PhD—Advanced Entry	347	Graduate Certificate Programs	162
Environmental Engineering, MSENVE	136	Graduate Certificate Programs	300
Exercise Science with Concentration in Physical Activity and Public Health, MS	220	Graduate Schools Academic Policies	24
Family Educational Rights and Privacy Act (FERPA)	29	Graduate Student Classification	41
Final Examinations and Related Policies on Other Exams	29	Graduate Student Government	17
Finance, MSF	62	Graduation Requirements	29
Finance—Evening/Part-Time Program, MSF	62	Graduation Requirements	264
Finance—Online Program, MSF	62	Health Certification	206
Financial Aid Assistance	21	Health Data Analytics, MS	92
Financial Markets and Institutions, Graduate Certificate	303	Health Data Analytics, MS	92
Forensic Accounting, Graduate Certificate	304	Health Informatics	90
Full-Time Status	259	Health Informatics Management and Exchange Graduate Certificate ...	222
Game Analytics, Graduate Certificate	52	Health Informatics Management and Exchange, Graduate Certificate ..	253
Game Design	50	Health Informatics, MS	93
Game Design, Graduate Certificate	304	Health Informatics, MS	221
Game Science and Design, MS	51	Health Informatics, MS	93
Game Science and Design, MS	51	Health Informatics, MS—ALIGN Program	94
General Admission and Transfer Credit	8	Health Informatics, MS—ALIGN Program	94
		Health Informatics Privacy and Security, Graduate Certificate	222

Health Informatics Privacy and Security, Graduate Certificate	253	Interdisciplinary Professional Studies, Graduate Certificate	307
Health Informatics Software Engineering Graduate Certificate	222	International Affairs, MA	363
Health Informatics Software Engineering, Graduate Certificate	253	International Biopharmaceutical Regulatory Affairs, Graduate Certificate	309
Health Management, Graduate Certificate	306	International Business, Graduate Certificate	78
Health Sciences	217	International Business, MSIB	63
Healthcare Administration and Policy, Graduate Certificate	77	International Management, MS	60
Higher Education Administration, Graduate Certificate	306	Investments, Graduate Certificate	78
History	350	IP Telephony Systems, Graduate Certificate	204
History, MA	352	JD/MBA	74
History, PhD	351	John A. and Marcia E. Curry Student Center	18
History, PhD—Advanced Entry	351	Journalism, MA	53
Homeland Security, MA	269	Law And Policy, DLP	267
Human Resources Management, Graduate Certificate	306	Law and Public Policy, JD/MS	369
Human Services, MS	286	Law and Public Policy, PhD	362
Husky Card Services	17	Law and Public Policy, PhD—Advanced Entry	363
Industrial Engineering	169	Law and Urban Public Health, JD/MPH	254
Industrial Engineering, MSIE	175	Leadership and Human Capital, Graduate Certificate	79
Industrial Engineering, PhD	170	Leadership, Graduate Certificate	309
Industrial Engineering, PhD—Advanced Entry	172	Leadership, MS	287
Informatics, MPS	277	Leading And Managing Technical Projects, Graduate Certificate	309
Information Assurance	94	Lean Six Sigma Graduate Certificate	169
Information Assurance	177	Learning Analytics, Graduate Certificate	310
Information Assurance and Cyber Security, MSIA	97	Learning Outcomes	102
Information Assurance and Cyber Security, MSIA—ALIGN Program	98	Legal Studies, MS—Online	255
Information Assurance, PhD	95	Liability Insurance	207
Information Assurance, PhD—Advanced Entry	96	Libraries	14
Information Design and Visualization, MFA	47	Living in Boston	13
Information for Entering Students	13	Marine and Environmental Sciences	324
Information for International Students	13	Marine Biology, MS—Three Seas Program	325
Information Security Management, Graduate Certificate	307	Marketing, Graduate Certificate	79
Information Systems	177	Master of Architecture and Sustainable Urban Environments—Combined Program	47
Information Systems, MSIS	178	Master of Architecture—One-Year Program	42
Information Technology Services	15	Master of Architecture—Three-Year Program	43
Innovation Management, Graduate Certificate	78	Master of Architecture—Three-Year Program—Advanced Degree Entrance	44
Innovation, MS	60	Master of Architecture—Two-Year Program	42
Institutional Calendars and Online Resources	418	Master of Business Administration	64
Interactive Design, Graduate Certificate	307	Master of Design for Sustainable Urban Environments—One-Year Program	45
Interdisciplinary	99	Master of Design for Sustainable Urban Environments—Two-Year Program	46
Interdisciplinary	249		
Interdisciplinary	341		
Interdisciplinary	374		
Interdisciplinary Arts, MFA	48		
Interdisciplinary Engineering PhD Program	179		

Master of Science	59	Nursing, PhD	223
Master's Degree Admission Requirements	257	Nursing, PhD—Advanced Entry	224
Master's Degree Policies	40	Nursing Practice, DNP	224
Master's Degree Programs	269	Nursing Practice with Concentration in Nurse Anesthesia, DNP	225
Mathematics	326	Nursing—Adult-Gerontology Nurse Practitioner, Acute Care, CAGS	225
Mathematics, MS	331	Nursing—Adult-Gerontology Nurse Practitioner, Acute Care, MS	228
Mathematics, PhD	326	Nursing—Adult-Gerontology Nurse Practitioner, Primary Care, CAGS	226
Mathematics, PhD—Advanced Entry	329	Nursing—Adult-Gerontology Nurse Practitioner, Primary Care, MS	229
Mechanical Engineering	179	Nursing—Direct Entry, MS	231
Mechanical Engineering, PhD	180	Nursing—Family Nurse Practitioner, Primary Care, MS	230
Mechanical Engineering, PhD—Advanced Entry	183	Nursing—Family Psychiatric Nurse Practitioner, CAGS	226
Mechanical Engineering with Concentration in General Mechanical Engineering, MSME	188	Nursing—Family Psychiatric Nurse Practitioner, MS	229
Mechanical Engineering with Concentration in Material Science, MSME	191	Nursing—Neonatal Nurse Practitioner, CAGS	226
Mechanical Engineering with Concentration in Mechanics and Design, MSME	190	Nursing—Neonatal Nurse Practitioner, MS	230
Mechanical Engineering with Concentration in Mechatronics, MSME	193	Nursing—Pediatric Nurse Practitioner, Acute and Primary Care, CAGS	227
Mechanical Engineering with Concentration in Thermofluids, MSME	195	Nursing—Pediatric Nurse Practitioner, Acute and Primary Care, MS	230
Medical Devices Regulatory Affairs, Graduate Certificate	310	Nursing—Pediatric Nurse Practitioner, Acute Care, CAGS	227
Medicinal Chemistry, MS	241	Nursing—Pediatric Nurse Practitioner, Primary Care, CAGS	228
Medicinal Chemistry, PhD	235	Nursing—Pediatric Nurse Practitioner, Primary Care, MS	231
MS/MBA—Nursing and Business Administration	71	Occupational Ergonomics and Health, MS	244
MSA/MBA—Professional Accounting Program	71	Office of the Registrar	15
MSF/MBA—Evening/Part-Time Program	72	Online and Video Streaming Examination Policy	104
MSF/MBA—Full-Time Program	71	Operations Research	197
MSF/MBA—Online Program	73	Operations Research, MSOR	198
Music	53	Operations Research, MSOR	332
Music Industry Leadership, JD/MS	58	Organizational Communication, Graduate Certificate	311
Music Industry Leadership, MS	54	Parking	18
Mutual Fund Management, Graduate Certificate	79	Personal Health Informatics, PhD	90
NEC/NU Joint Certificate Program—General Certificate of Merit in Music Performance	55	Personal Health Informatics, PhD	249
NEC/NU Joint Certificate Program—Professional Studies Certificate in Music Performance	56	Personal Information	264
Network Science, PhD	374	Personal Professional Enrichment (PPE)	258
New Student Orientation (On-Ground and Online)	258	Petitions	106
Nonprofit Management, Graduate Certificate	311	Pharmaceutical Sciences, MS	241
Nonprofit Management, MS	288	Pharmaceutical Sciences, PhD	236
Nonprofit Sector, Philanthropy, and Social Change, Graduate Certificate	368	Pharmacology, MS	241
Northeastern University Bookstore	18	Pharmacology, PhD	236
Nurse Anesthesia, CAGS	227	Pharmacy and Public Health, PharmD/MPH	221
Nursing Administration, MS	232	Pharmacy and Public Health, PharmD/MPH	221
Nursing and Business Administration, MS/MBA	233	Pharmacy, PharmD	237
Nursing Anesthesia, MS	232	Pharmacy, PharmD—Direct Entry	237
		Physical Therapy, DPT	245
		Physical Therapy, DPT—Direct Entry	245

Physical Therapy, Movement, and Rehabilitation Sciences	243	Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Regulatory Compliance, MS	295
Physician Assistant	247	Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Strategic Regulatory Affairs, MS	296
Physician Assistant Studies and Public Health, MS/MPH	248	Regulatory Affairs of Food and Food Industries, MS	297
Physician Assistant Studies, MS	247	Reinstatement after Academic Dismissal	262
Physics	332	Remote Sensing, Graduate Certificate	313
Physics, MS	338	Renewable Energy, Graduate Certificate	160
Physics, PhD	333	Respiratory Care Leadership, MS	298
Physics, PhD—Advanced Entry	335	Respiratory Specialty Practice, Graduate Certificate	314
Political Science	353	Satisfactory Progress	316
Political Science, MA	355	School of Architecture	41
Political Science, PhD	353	School of Criminology and Criminal Justice	342
Political Science, PhD—Advanced Entry	354	School of Journalism	53
Population Health, PhD	218	School of Law	255
Port Security, Graduate Certificate	311	School of Nursing	222
Practicum/Internship Policies	206	School of Pharmacy	234
Process Safety Engineering, Graduate Certificate	123	School of Public Policy and Urban Affairs	361
Professional Sports Administration, Graduate Certificate	312	School Psychology, MS/CAGS	214
Program and Portfolio Management, Graduate Certificate	312	School Psychology, PhD	210
Project Management, Graduate Certificate	312	Security and Resilience Studies, Graduate Certificate	359
Project Management, MS	290	Security and Resilience Studies, MS	358
Psychology	339	Seeking more than One Certificate or Degree	263
Psychology, PhD	339	Social Media and Online Communities, Graduate Certificate	314
Psychology, PhD—Advanced Entry	340	Sociology	370
Public Administration, MPA	357	Sociology, MA	374
Public Administration, MPA	357	Sociology, PhD	370
Public and Media Relations, Graduate Certificate	313	Sociology, PhD—Advanced Entry	372
Public Health, MPH	219	Special Student Status	257
Public History, Graduate Certificate	353	Speech-Language Pathology, MS	217
Public Policy Analysis, Graduate Certificate	368	Sports Leadership, MSLD	299
Public Policy, MPP	366	Statements of Accreditation	416
Public Safety	18	Student Evaluation of Courses (EvaluationKit)	261
Readmission to Program	259	Student Records and Transcripts	26
Reentry to Program	259	Student Refunds	20
Registration and Taking Courses	260	Student Right-to-Know Act	30
Regulations Applying only to Doctor of Philosophy (PhD) Programs	9	Student's Academic Standing	208
Regulations Applying to All Degree Programs	8	Students' Bill of Academic Rights and Responsibilities	38
Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Clinical Research Regulatory Affairs, MS	291	Studio Arts—School of the Museum of Fine Arts, MFA	49
Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in General Regulatory Affairs, MS	292	Supply Chain Engineering Management, Graduate Certificate	168
Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in International Regulatory Affairs, MS	293	Supply Chain Management, Graduate Certificate	80
Regulatory Affairs for Drugs, Biologics, and Medical Devices with Concentration in Operational Regulatory Affairs, MS	294	Supply Chain Management—Online Program, Graduate Certificate	80
		Sustainable Building Systems	200
		Sustainable Building Systems, MSSBS	200

Sustainable Energy Systems, Graduate Certificate	161
Taxation, MST	63
Taxation—Online Program, MST	63
Teaching, Elementary Licensure, MAT	270
Teaching English To Speakers Of Other Languages, Graduate Certificate	314
Teaching, Secondary Licensure, MAT	271
Technical Communication, MS	298
Technological Entrepreneurship, Graduate Certificate	80
Technological Entrepreneurship, MS	61
Technology Systems Mangement, Graduate Certificate	168
Telecommunication Systems Management Graduate Certificates	204
Telecommunications Systems Management	202
Telecommunications Systems Management, MSTSM	202
The Doctor of Philosophy Degree (PhD)	317
The Master's Degree Academic Requirements	318
Time Limitation	317
Transfer Credit	316
Transfer Credit Policies	257
Transfer of Credit	81
Transfer of Credit	207
Transitional Doctor of Physical Therapy, DPT	267
Transitional Doctor of Physical Therapy, DPT—Direct Entry	268
Tuition and Fees	20
University Faculty	378
University Health and Counseling Services	19
University Leadership	415
University-Wide Academic Policies and Procedures	24
Urban and Regional Policy, MS	367
Urban Informatics, Graduate Certificate	369
Urban Informatics, MS	367
Urban Studies, Graduate Certificate	369
We Care	19
Women's, Gender, and Sexuality Studies, Graduate Certificate	376