Electrical Engineering and Music with concentration in Music Technology, BSEE

This intercollege combined major is designed for students who would like to explore their interest in music technology while earning the benefit of a Bachelor of Science degree in electrical engineering. The music industry relies heavily on electronic technology in the production (e.g., studio and recording technology); performance (e.g., musical instruments, stage technology); and distribution (e.g., audio file formats, encoding) of music. The program is designed to give students a firm foundation in digital and analog audio electronics and to learn the breadth and depth of the convergence between electrical engineering and music technology.

Program Requirements

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

Universitywide Requirements

All undergraduate students are required to complete the Universitywide Requirements (http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/).

NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (http://catalog.northeastern.edu/undergraduate/university-academics/nupath/).

NUpath requirements Societies and Institutions (SI) and Differences and Diversity (DD) are not explicitly satisfied by required engineering courses. Students are responsible for satisfying these requirements with general electives.

Engineering Requirements

Code	Title	Hours
Required Courses		
EECE 2140	Computing Fundamentals for Engineers	4
EECE 2150	Circuits and Signals: Biomedical Applications	5
EECE 2160	Embedded Design: Enabling Robotics	4
Electrical Engineering Fundamentals		
EECE 2412 and EECE 2413	Fundamentals of Electronics and Lab for EECE 2412	5
EECE 2520	Fundamentals of Linear Systems	4
EECE 2530 and EECE 2531	Fundamentals of Electromagnetics and Lab for EECE 2530	5
Computer Engineering Fundamentals		
Complete one of the following. If more than one computer engineering fundamentals course is taken, it may count as a technical elective:		4-5
EECE 2322 and EECE 2323	Fundamentals of Digital Design and Computer Organization and Lab for EECE 2322	
EECE 2540	Fundamentals of Networks	
EECE 2560	Fundamentals of Engineering Algorithms	
Electrical Engineering Capstone Courses		
EECE 4791	Electrical and Computer Engineering Capstone 1	1
EECE 4792	Electrical and Computer Engineering Capstone 2	4
Technical Electives		
Students can register for EECE 4991 / EECE 4992 / EECE 4993 more than once. For these courses combined, a maximum of 8 semester hours will be allowed to satisfy the requirement of technical electives. An additional 4 semester hours will be allowed as a general elective. At most one of these courses (4 semester hours) can be taken in a semester.		
Though students may register for EECE 2750 more than once, only 4 semester hours will be allowed to satisfy the requirements of technical electives. An additional 4 semester hours will be allowed as a general elective.		
Complete two of the following. If EECE 5697 is taken, students are required to complete a music elective.		8
EECE 2322 and EECE 2323	Fundamentals of Digital Design and Computer Organization and Lab for EECE 2322	
EECE 2540	Fundamentals of Networks	

EECE 2750	Enabling Engineering
EECE 3324	Computer Architecture and Organization
EECE 3410	Electronic Design
EECE 4512	Healthcare Technologies: Sensors, Systems, and Analysis
EECE 4991	Research
EECE 4992	Directed Study
EECE 4993	Independent Study
EECE 5115 to EECE 5698	
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage

Supplemental Credit		
2 semester hours from the following course count toward the engineering requirement:		2
EECE 3468	Noise and Stochastic Processes	
2 semester hours from the following course count toward the engineering requirement:		2
GE 1501	Cornerstone of Engineering 1 [1]	
3 semester hours from the following course count toward the engineering requirement:		3
GE 1502	Cornerstone of Engineering 2 [1]	

Music Requirements

Code	Title	Hours
Music Theory		
Complete one of the following pairs:		8
MUSC 1119 and MUSC 1201	Fundamentals of Western Music Theory and Music Theory 1	
MUSC 1201 and MUSC 1202	Music Theory 1 and Music Theory 2	
MUSC 1202 and MUSC 3541	Music Theory 2 and Music Analysis Seminar	
Required Context Course		
MUSC 1002 and MUSC 1003	Music in Everyday Life and Lab for MUSC 1002	4
Music in Context		
Complete one of the following:		4
MUSC 2101	Black Popular Music	
MUSC 2105	Songs That Made History	
MUSC 2130	Music of Asia	
MUSC 2150	Making a Musical: Analysis, Craft, and Creation	
MUSC 2310	Popular Music Since 1945	
MUSC 2311	Topics in American Music	
MUSC 2312	Topics in Western Art Music	
MUSC 2313	Topics in World Music	
MUSC 2317	Punk Rock	
MUSC 2320	40,000 Years of Music Technology	
MUSC 2340	Divas, DJs, and Double Standards	
MUSC 2351	Music, Sound, and the Screen	
MUSC 2380	The World of Choral Music	
MUSC 3352	Sounding Human	
MUSC 3353	Music and the Racial Imagination	
MUSC 3354	Sound and the Sacred	
MUSC 3560	Topics in Music since 1900	
MUSI 3401	Hip Hop in the Music Industry	
MUSI 3351	Music and Social Justice	
MUSI 3360	Global Music Industries in Context	
MUSI 5900	Ethnography in Creative Industries	
Acoustics or Music Elective		

Complete one of the following. If EECE 5697 is taken, students are required to complete a music elective.		4
MUSC 2350	Acoustics and Psychoacoustics of Music	
MUSC 2000 to MUSC 5999		
Music Technology		
MUST 1220	Introduction to Music Technology	4
MUST 2431	Computer Music Fundamentals	4
Music Technology Electives		
Complete two of the following. Other appropriate MUST courses will be considered by petition to fulfill this category.		8
MUSC 4510	Music and the Brain Research	
MUST 3540	Special Topics in Music Technology	
MUST 3601	Digital Audio Signal Processing	
MUST 3602	Electronics for Music	
MUST 3603	Embedded Audio Programming	
MUST 4610	Composition for Electronic Instruments	

Supporting Courses: Mathematics/Science

Complete all mathematics/science courses with a minimum of 30 semester hours.

Code	Title	Hours
CHEM 1151 and CHEM 1153	General Chemistry for Engineers and Recitation for CHEM 1151	4
MATH 1341	Calculus 1 for Science and Engineering	4
MATH 1342	Calculus 2 for Science and Engineering	4
MATH 2321	Calculus 3 for Science and Engineering	4
MATH 2341	Differential Equations and Linear Algebra for Engineering	4
PHYS 1151 and PHYS 1152 and PHYS 1153	Physics for Engineering 1 and Lab for PHYS 1151 and Interactive Learning Seminar for PHYS 1151	5
PHYS 1155 and PHYS 1156 and PHYS 1157	Physics for Engineering 2 and Lab for PHYS 1155 and Interactive Learning Seminar for PHYS 1155	5
2 semester hours from the following course count toward this requirement:		2
EECE 3468	Noise and Stochastic Processes	
Supplemental Credit		
1 semester hour from the following course counts toward the mathematics/science requirement:		1
GE 1501	Cornerstone of Engineering 1 [1]	

Professional Development

Code	Title	Hours
GE 1000	First-Year Seminar	1
ENCP 2000	Introduction to Engineering Co-op Education	1
ENCP 3000	Professional Issues in Engineering	1
Additional Required Courses		
1 semester hour from the following course counts toward the professional development requirement:		1
GE 1501	Cornerstone of Engineering 1 [1]	
1 semester hour from the following course counts toward the professional development requirement:		1
GE 1502	Cornerstone of Engineering 2 [1]	

Writing Requirements

Code	Title	Hours
A grade of C or higher is required:		
ENGW 1111	First-Year Writing	4
ENGW 3302	Advanced Writing in the Technical Professions	4
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Required General Electives

Code	Title	Hours
Complete 4 semester hours of academic, nonremedial, nonrepetitive courses.		4

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Students can substitute GE 1110 and GE 1111 for GE 1501 and 1502 in approved situations.

Major GPA Requirement

Minimum 2.000 GPA required in EECE courses

Music Grade Requirement

Students must maintain at least a 2.667 GPA (B– average) in the requirements of the music half of the combined major and also complete all required music courses with grades of at least C. Students who fail to meet the above standards will be placed on departmental probation; those who remain on probation for two consecutive semesters will be dropped from the major.

Program Requirement

137 total semester hours required

Plan of Study
Four Years, One Co-Op in Summer 2/Fall

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 (ND)	4	GE 1502 (ER)	4	MATH 2341	4	Vacation	
CHEM 1153	0	MATH 1342 (FQ)	4	PHYS 1155 (ND)	3		
ENGW 1111 (WF)	4	MUST 1220 (AD)	4	PHYS 1156 (AD)	1		
GE 1000	1	PHYS 1151 (ND)	3	PHYS 1157	1		
GE 1501	4	PHYS 1152 (AD)	1				
MATH 1341 (FQ)	4	PHYS 1153	1				
	17		17		9		0

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
EECE 2140	4	EECE 2160	4	Vacation	0	Co-op	0
EECE 2150 (AD)	5	ENCP 2000	1				
MATH 2321 (FQ)	4	MUSC 1002 and MUSC 1003	4				
MUST 2431 (FQ, AD)	4	EE fundamentals	4				
		EE fundamentals	5				
	17		18		0		0

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	ENCP 3000	1	Vacation	0	EECE 3468	4
		ENGW 3302 or 3315 (WD)	4			EECE 4791 (EI, WI, CE)	1
		CE fundamentals	4			General elective	4
		EE fundamentals	5				
		EECE technical elective	4				
	0		18		0		9

Year 4

Fall	Hours	Spring	Hours
EECE 4792 (EI, WI, CE)	4	EECE technical elective	4
Music technology elective	4	Music in context	4
Music technology elective	4	Music elective	4
Music theory course	4	Music theory course	4
	16		16

Total Hours: 137

Five Years, Three Co-Ops in Spring / Summer 1

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 (ND)	4	GE 1502 (ER)	4	Vacation	0	Vacation	
CHEM 1153	0	MATH 1342 (FQ)	4				
ENGW 1111 (WF)	4	MUST 1220 (AD)	4				
GE 1000	1	PHYS 1151 (ND)	3				
GE 1501	4	PHYS 1152 (AD)	1				
MATH 1341 (FQ)	4	PHYS 1153	1				
	17		17		0		0

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
EECE 2140	4	Co-op		Co-op		Vacation	
ENCP 2000	1						
MATH 2341	4						
MUST 2431 (FQ, AD)	4						
PHYS 1155 (ND)	3						
PHYS 1156 (AD)	1						
PHYS 1157	1						
	18		0		0		0

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
EECE 2150 (AD)	5	Co-op		Co-op		ENGW 3302 or 3315 (WD)	4
EECE 2160	4					General elective	4
MATH 2321 (FQ)	4						
MUSC 1002 and MUSC 1003	4						
	17		0		0		8

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ENCP 3000	1	Co-op		Co-op		EECE 3468	4
CE fundamentals	4					EECE 4791 (EI, CE, WI)	1
EE fundamentals	4					ECE technical elective	4
EE fundamentals	5						
Music theory course	4						
	18		0		0		9

Year 5

Fall	Hours	Spring	Hours
EECE 4792 (EI, CE, WI)	4	ECE technical elective	4
EE fundamentals	5	Music in context	4
Music technology elective	4	Music elective	4
Music technology elective	4	Music theory course	4
	17		16

Total Hours: 137

Notes:

The capstone design courses are taken as follows:

- Electrical and Computer Engineering Capstone 1 (EECE 4791) in Summer 1 and Electrical and Computer Engineering Capstone 2 (EECE 4792) in Spring

    ... or...

- Electrical and Computer Engineering Capstone 1 (EECE 4791) in Summer 2 and Electrical and Computer Engineering Capstone 2 (EECE 4792) in Fall.