

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required
 Transition students are required to complete 132 total semester hours
 Minimum 2.000 GPA required

BS in Computer Science and Multimedia Studies

See page 216.

MUSIC

www.music.neu.edu

ANTHONY P. DE RITIS, PhD
Associate Professor and Chair

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David D. Sonnenschein, DMA

The music department approaches the study of music from a global, multicultural, and multifaceted perspective. The department offers three concentrations in the context of a broad liberal arts program.

The music industry concentration is the first such undergraduate program in Boston. It is designed for students with an interest in fields such as artist management, the music products industry, the record industry, arts administration, contracting and legal issues, the recording process, and studio techniques. Developed in collaboration with Northeastern's College of Business Administration, the music industry concentration leads to a Bachelor of Science degree.

The music history and analysis concentration includes courses in Western classical music, American music, world music, music theory, and ear training. Students may combine this concentration with the minor in music performance, which entails an audition, private lessons, ensemble performance, and two recitals. They may also combine this concentration with a minor in music industry, ethnomusicology, or music theatre. The music history and analysis concentration leads to a Bachelor of Arts degree.

The music technology concentration teaches students to compose music using the newest electronic music technology, both hardware and software. Students learn techniques such as MIDI sequencing, digital and analog recording, sound design, audio for video, and the latest methods for delivering music over the Internet. Students also study composition for both acoustic and electronic instruments. The concentration includes a thorough background in the fundamentals of music, including music theory and history, and leads to a Bachelor of Science degree.

Through an exchange program, students may attend classes at the New England Conservatory of Music. Students also share an array of high-tech and multimedia equipment.

While some music courses are designed for music majors, the department also offers elective survey courses. Several of these courses fulfill the College of Arts and Sciences core curriculum requirement.

An extensive concert series offers a variety of performances by students, faculty, and guest artists. Students also have the opportunity to participate in active choral groups, bands, chamber ensembles, and the University orchestra. See pages 417–424 for course descriptions.

BA in Music with Concentration in Music History and Analysis**COLLEGE OF ARTS AND SCIENCES****BA CORE REQUIREMENTS**

See page 48 for requirement list.

MUSIC REQUIREMENTS FOR MUSIC HISTORY AND ANALYSIS CONCENTRATION***Music Theory and Musicianship***

Complete the following eight courses. Music theory courses and musicianship courses should be taken concurrently, as indicated:

MUS U201	Music Theory 1	4 SH
with MUS U241	Musicianship 1	1 SH
MUS U202	Music Theory 2	4 SH
with MUS U242	Musicianship 2	1 SH

MUS U303	Music Theory 3	4 SH
with MUS U343	Musicianship 3	1 SH
MUS U304	Music Theory 4	4 SH
with MUS U344	Musicianship 4	1 SH

Music History

Complete the following four courses. MUS U550 can be taken multiple times:

MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH
MUS U550	Historical Traditions 4: Special Topics	4 SH

Music Literature

Complete the following course:

MUS U308	Principles of Music Literature	4 SH
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Piano Class

Complete the following course:

MUS U205	Piano Class 1	4 SH
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Music Ensemble

Complete five music ensembles:

MUS U904	Chorus	1 SH
MUS U905	Band	1 SH
MUS U906	Orchestra	1 SH
MUS U911	Jazz Ensemble	1 SH
MUS U912	Rock Ensemble	1 SH
MUS U913	Blues/Rock Ensemble	1 SH
MUS U914	Create Your Own Music	1 SH
MUS U915	Chamber Ensembles	1 SH
MUS U916	Electronic Music Ensemble	1 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

MUSIC HISTORY AND ANALYSIS MAJOR CREDIT REQUIREMENT

Complete 49 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Transition students are required to complete 132 total semester hours

Minimum 2.000 GPA required

BS in Music with Concentration in Music Industry**COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR ARTS/HUMANITIES MAJORS**

See page 50 for requirement list.

MUSIC INDUSTRY REQUIREMENTS**Music Theory Requirement**

Complete the following two courses:

MUS U203	Music Theory for Music Industry 1	4 SH
MUS U204	Music Theory for Music Industry 2	4 SH

Music History

Complete the following four courses. MUS U550 can be taken multiple times:

MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH
MUS U550	Historical Traditions 4: Special Topics	4 SH

Music Literature

Complete the following course:

MUS U308	Principles of Music Literature	4 SH
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Music Ensemble

Complete two music ensembles:

MUS U904	Chorus	1 SH
MUS U905	Band	1 SH
MUS U906	Orchestra	1 SH
MUS U911	Jazz Ensemble	1 SH
MUS U912	Rock Ensemble	1 SH
MUS U913	Blues/Rock Ensemble	1 SH
MUS U914	Create Your Own Music	1 SH
MUS U915	Chamber Ensembles	1 SH
MUS U916	Electronic Music Ensemble	1 SH

Music Industry

Complete the following three courses:

MUS U230	Music Industry 1	4 SH
MUS U231	Music Industry 2	4 SH
MUS U601	Seminar in Music Industry	4 SH

Music Industry Electives

Complete four of the following courses:

MUS U220	Music and Technology 1	4 SH
MUS U221	Music and Technology 2	4 SH
MUS U232	Music Recording 1	4 SH
MUS U233	Music Production for Radio and Web	4 SH
MUS U330	Performing Arts Administration	4 SH
MUS U331	Music Recording 2	4 SH
MUS U332	Artist Management	4 SH
MUS U333	The Record Industry	4 SH
MUS U334	Music Products Industry	4 SH
MUS U335	Copyright Law for Musicians	4 SH
MUS U336	Computer Applications in Music Business	4 SH
MUS U337	Writing about Music	4 SH
MUS U338	Music Industry Marketing and Promotion	4 SH
MUS U530	Music Entrepreneurship	4 SH

BUSINESS COURSE REQUIREMENTS**Economics**

Complete the following two courses:

ECN U115	Principles of Macroeconomics	4 SH
ECN U116	Principles of Microeconomics	4 SH

Accounting

Complete the following course:

ACC U209 Financial Accounting and Reporting 4 SH

Business Electives

Complete two business courses from the following departments:

ACC, CBA, FIN, HRM, MGT, MKT, or MSC.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

MUSIC INDUSTRY MAJOR CREDIT REQUIREMENT

Complete 78 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Transition students are required to complete 132 total semester hours

Minimum 2.000 GPA required

BS in Music with Concentration in Music Technology**COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR ARTS/HUMANITIES MAJORS**

See page 50 for requirement list.

GENERAL MUSIC REQUIREMENTS**Music Theory and Musicianship**

Complete the following four courses with corresponding musicianship courses:

MUS U201	Music Theory 1	4 SH
with MUS U241	Musicianship 1	1 SH
MUS U202	Music Theory 2	4 SH
with MUS U242	Musicianship 2	1 SH
MUS U303	Music Theory 3	4 SH
with MUS U343	Musicianship 3	1 SH
MUS U304	Music Theory 4	4 SH
with MUS U344	Musicianship 4	1 SH

Music History

Complete the following four courses:

MUS U308	Principles of Music Literature	4 SH
MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH

Music Composition

Complete the following three courses:

MUS U250	Instrumentation and Notation	4 SH
MUS U420	Music Composition Seminar 1	4 SH
MUS U422	Music Composition Seminar 2	4 SH

Composition Lessons

Complete the following (repeatable) course six times:

MUS U903	Composition Lessons	1 SH
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Ensemble

Complete two music ensembles:

MUS U904	Chorus	1 SH
MUS U905	Band	1 SH
MUS U906	Orchestra	1 SH
MUS U911	Jazz Ensemble	1 SH
MUS U912	Rock Ensemble	1 SH
MUS U913	Blues/Rock Ensemble	1 SH
MUS U914	Create Your Own Music	1 SH
MUS U915	Chamber Ensembles	1 SH
MUS U916	Electronic Music Ensemble	1 SH

MUSIC TECHNOLOGY REQUIREMENTS**Music Technology**

Complete the following four courses:

MUS U220	Music and Technology 1	4 SH
MUS U221	Music and Technology 2	4 SH
MUS U315	History of Electronic Music	4 SH
MUS U421	Digital Audio Processing	4 SH

Electronic Composition and Performance

Complete the following four courses:

MUS U320	Sound Design	4 SH
MUS U520	Interactive Real-Time Performance	4 SH
MUS U610	Composition for Electronic Instruments	4 SH
MUS U611	Music Technology Capstone/Senior Recital	4 SH

Music Technology Electives

Complete one course from the following list, or see your adviser for approval of other acceptable courses:

ART U130	Visual Studies Foundation 1	4 SH
ART U180	Video Basics	4 SH
ART U290	Introduction to Digital Tools	4 SH
MMS U305	Programming for Multimedia	4 SH
MMS U400	Hypermedia	4 SH
MUS U233	Music Production for Radio and Web	4 SH
MUS U336	Computer Applications in Music Business	4 SH
MUS U699	Advanced Television Production	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

MUSIC TECHNOLOGY MAJOR CREDIT REQUIREMENT

Complete 92 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Transition students are required to complete 132 total semester hours

Minimum 2.000 GPA required

BS in Computer Science and Music with Concentration in Music Technology

See page 217.

Minor in General Music

MUSIC THEORY AND MUSICIANSHIP

Complete the following four courses. Music Theory and Musicianship should be taken concurrently as indicated:

MUS U201	Music Theory 1	4 SH
with MUS U241	Musicianship 1	1 SH
MUS U202	Music Theory 2	4 SH
with MUS U242	Musicianship 2	1 SH

PRINCIPLES IN MUSIC LITERATURE

Complete the following course:

MUS U308	Principles of Music Literature	4 SH
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MUSIC HISTORY ELECTIVE

Complete one course from the following list:

MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH
MUS U315	History of Electronic Music	4 SH
MUS U550	Historical Traditions 4: Special Topics	4 SH

MUSIC ELECTIVE

Complete one course from the Department of Music.

GPA REQUIREMENT

2.000 GPA required in the minor

Minor in Ethnomusicology

REQUIRED COURSES

Complete the following four courses. MUS U201 and MUS U241 should be taken concurrently:

MUS U201	Music Theory 1	4 SH
with MUS U241	Musicianship 1	1 SH
MUS U308	Principles of Music Literature	4 SH
MUS U350	Introduction to Ethnomusicology	4 SH

Music industry majors may substitute the following course for MUS U201:

MUS U203	Music Theory for Music Industry 1	4 SH
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ETHNOMUSICOLOGY ELECTIVES

Complete three of the following courses:

MUS U104	Survey of African-American Music	4 SH
MUS U127	Introduction to World Music	4 SH
MUS U128	Music of Africa	4 SH
MUS U130	Music of Asia	4 SH
MUS U131	Music of Latin America and the Caribbean	4 SH
MUS U132	Music of the Jewish People	4 SH

GPA REQUIREMENT

2.000 GPA required in the minor

Minor in Music Industry

MUSIC THEORY AND LITERATURE

Complete the following two courses:

MUS U101	Introduction to Music	4 SH
or MUS U308	Principles of Music Literature	4 SH
MUS U203	Music Theory for Music Industry 1	4 SH
or MUS U201	Music Theory 1	4 SH

MUSIC INDUSTRY

Complete the following two courses:

MUS U230	Music Industry 1	4 SH
MUS U231	Music Industry 2	4 SH

MUSIC INDUSTRY ELECTIVES

Complete two music industry courses.

GPA REQUIREMENT

2.000 GPA required in the minor

Minor in Music Performance

Restricted to music majors.

MUSIC THEORY AND MUSICIANSHIP

Complete the following eight courses. Music Theory and Musicianship should be taken concurrently, as indicated.

Music industry majors take program-specific music theory courses, as outlined below. A minimum grade of C or better is required in music theory courses:

MUS U201	Music Theory 1	4 SH
with MUS U241	Musicianship 1	1 SH
MUS U202	Music Theory 2	4 SH
with MUS U242	Musicianship 2	1 SH
MUS U303	Music Theory 3	4 SH
with MUS U343	Musicianship 3	1 SH
MUS U304	Music Theory 4	4 SH
with MUS U344	Musicianship 4	1 SH

Music Industry Majors Only

MUS U203	Music Theory for Music Industry 1	4 SH
with MUS U241	Musicianship 1	1 SH
MUS U204	Music Theory for Music Industry 2	4 SH
with MUS U242	Musicianship 2	1 SH
MUS U303	Music Theory 3	4 SH
with MUS U343	Musicianship 3	1 SH
MUS U304	Music Theory 4	4 SH
with MUS U344	Musicianship 4	1 SH

PERFORMANCE PRACTICE

Complete the following course:

MUS U621	Seminar in Performance Practice	4 SH
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MUSIC LESSONS

Complete the following (repeatable) course three times:

MUS U901	Music Lessons 1	1 SH
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MUSIC RECITALS

Complete the following two courses:

MUS U410	Recital 1	1 SH
MUS U622	Recital 2	1 SH

MUSIC ENSEMBLE

Complete seven music ensembles:

MUS U904	Chorus	1 SH
MUS U905	Band	1 SH
MUS U906	Orchestra	1 SH
MUS U911	Jazz Ensemble	1 SH
MUS U912	Rock Ensemble	1 SH
MUS U913	Blues/Rock Ensemble	1 SH
MUS U914	Create Your Own Music	1 SH
MUS U915	Chamber Ensembles	1 SH
MUS U916	Electronic Music Ensemble	1 SH

GPA REQUIREMENT

2.000 GPA required in the minor

Minor in Music Theatre**MUSIC THEORY, LITERATURE, AND THEATRE**

Complete the following four courses:

MUS U201	Music Theory 1	4 SH
	with MUS U241 Musicianship 1	1 SH
MUS U308	Principles of Music Literature	4 SH
THE U310	American Musical Theatre	4 SH

MUSIC HISTORY ELECTIVE

Complete one course from the following list:

MUS U311	Historical Traditions 1: America	4 SH
MUS U312	Historical Traditions 2: Classical	4 SH
MUS U313	Historical Traditions 3: World	4 SH
MUS U315	History of Electronic Music	4 SH
MUS U550	Historical Traditions 4: Special Topics	4 SH

VOICE LESSONS

Complete four semesters of voice lessons (courses are repeatable):

MUS U901	Music Lessons 1	1 SH
MUS U902	Music Lessons 2	1 SH

PERFORMANCE: CHORUS

Complete four semesters of chorus:

MUS U904	Chorus	1 SH
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MUSIC ELECTIVE

Complete one course from the Department of Music.

GPA REQUIREMENT

2.000 GPA required in the minor

PHILOSOPHY AND RELIGION

www.philosophy.neu.edu

SUSAN M. SETTA, PHD
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Ronald L. Sandler, PhD

LECTURERS

D. Kerry Dugan, MEd
Margaret C. Huff, PhD
Michael C. Meyer, PhD

Philosophy addresses questions and theories related to morality, society, religion, and the natural and social sciences. The study of philosophy challenges students to examine, through critical reflection, their beliefs in many areas.

Courses aim to provide students with an understanding of the methods and traditions of philosophical and religious thought. Through readings, discussion, and writing, students examine questions concerning the nature and validity of religious beliefs, moral judgments, political ideas, and scientific theories, as well as questions about values and social policy in such areas as law, medicine, and technology.

Course work in philosophy can strengthen the student's work in other areas. Philosophy majors enter diverse careers, ranging from college-level teaching to law and business. The program strives to help students sharpen their critical abilities. The department offers three ways to major in philosophy: the standard major, the concentration in law and ethics, and the concentration in religious studies. See pages 428–433 for course descriptions.

BA/BS in Philosophy**COLLEGE OF ARTS AND SCIENCES BA CORE REQUIREMENTS OR BS CORE REQUIREMENTS FOR ARTS/HUMANITIES MAJORS**

For BA core, see page 48 for requirement list.

For BS core, see page 50 for requirement list.

CONCENTRATION

Complete either the philosophy generalist requirements, the concentration in law and ethics, or the concentration in religious studies.

Philosophy Generalist**PHILOSOPHY REQUIRED COURSES**

Complete the following three courses:

PHL U115	Introduction to Logic	4 SH
or PHL U215	Symbolic Logic	4 SH
PHL U325	Ancient Philosophy	4 SH
PHL U330	Modern Philosophy	4 SH

ADVANCED PHILOSOPHY ELECTIVE

Complete one course from the following list:

PHL U435	Moral Philosophy	4 SH
PHL U500	Theory of Knowledge	4 SH
PHL U505	Metaphysics	4 SH
PHL U535	Philosophy of Mind	4 SH

PHILOSOPHY SEMINAR

Complete one seminar:

PHL U605	Advanced Seminar: Spinoza	4 SH
PHL U901	Topics in Philosophy Seminar	4 SH
PHL U902	Great Philosophers Seminar	4 SH
PHL U903	Seminar in Religion	4 SH

ADDITIONAL ELECTIVES

Complete four additional electives in philosophy.

Concentration in Law and Ethics**PHILOSOPHY REQUIRED COURSES**

Complete the following four courses:

PHL U115	Introduction to Logic	4 SH
or PHL U215	Symbolic Logic	4 SH
PHL U325	Ancient Philosophy	4 SH
PHL U330	Modern Philosophy	4 SH
PHL U435	Moral Philosophy	4 SH

PHILOSOPHY SEMINAR

Complete one course from the following list:

PHL U605	Advanced Seminar: Spinoza	4 SH
PHL U901	Topics in Philosophy Seminar	4 SH
PHL U902	Great Philosophers Seminar	4 SH
PHL U903	Seminar in Religion	4 SH

PHILOSOPHY ELECTIVE

Complete one course in philosophy.

LAW-RELATED ELECTIVES

Complete two courses from the social science departments listed below. Courses are to be chosen in consultation with department: AFR, ECN, HS, HST, IAF, LIN, POL, PSY, SOA, or SOC.

Concentration in Religious Studies**PHILOSOPHY REQUIRED COURSES**

Complete the following four courses:

PHL U115	Introduction to Logic	4 SH
or PHL U215	Symbolic Logic	4 SH
PHL U325	Ancient Philosophy	4 SH
PHL U330	Modern Philosophy	4 SH
PHL U435	Moral Philosophy	4 SH

PHILOSOPHY SEMINAR

Complete one seminar:

PHL U605	Advanced Seminar: Spinoza	4 SH
PHL U901	Topics in Philosophy Seminar	4 SH
PHL U902	Great Philosophers Seminar	4 SH
PHL U903	Seminar in Religion	4 SH
PHL U904	Major Figures in Religious Studies	4 SH
PHL U906	Topics in Religious Studies	4 SH

RELIGIOUS STUDIES COURSES

Complete three elective courses. See department for an approved list.

PHILOSOPHY ELECTIVE

Complete one elective course in philosophy.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

PHILOSOPHY MAJOR CREDIT REQUIREMENT

Complete 32 semester hours in the major.

UPPER-DIVISION ELECTIVES

Complete three general electives at 300 level or above.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Transition students are required to complete 132 total semester hours

Minimum 2.000 GPA required

BA in Cinema Studies and Philosophy

See page 79.

BS in Physics and Philosophy

See page 140.

Minor in Philosophy**REQUIRED COURSES**

Complete the following two courses:

PHL U325	Ancient Philosophy	4 SH
PHL U330	Modern Philosophy	4 SH

ELECTIVE COURSES

Complete three philosophy courses.

GPA REQUIREMENT

2.000 GPA required in the minor

Minor in Religious Studies**REQUIRED COURSES**

Complete the following four courses:

PHL U150	Understanding the Bible	4 SH
PHL U275	Eastern Religions	4 SH
PHL U280	Islam	4 SH
PHL U390	Cults and Sects	4 SH

ELECTIVE COURSE

Complete one religious studies elective.

GPA REQUIREMENT

2.000 GPA required in the minor

PHYSICS

www.physics.neu.edu

ROBERT P. LOWNDES, PhD
Professor and Interim Chair

MATTHEWS DISTINGUISHED UNIVERSITY PROFESSORS

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COLLEGE OF ARTS AND SCIENCES
DISTINGUISHED PROFESSORS

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Robert S. Markiewicz, PhD
Jeffrey B. Sokoloff, PhD
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Michael T. Vaughn, PhD
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Armen Stepanyants, PhD
Mark C. Williams, PhD

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Michael J. Glaubman, PhD
Bertram J. Malenka, PhD
Clive H. Perry, PhD
Eugene J. Saletan, PhD
Carl Shiffman, PhD
Eberhard von Goeler, PhD

Physics examines the fundamental principles that govern natural phenomena, ranging in scale from collisions of subatomic particles, through the behavior of solids, liquids, and biomolecules, to exploding stars and colliding galaxies.

The program aims to help students experience the intellectual stimulation of studying physics and astrophysics and the excitement of frontline research; understand the basic principles and techniques of physics-related careers; and prepare for graduate study in physics or related fields.

The department offers four levels of undergraduate courses: descriptive courses for nonscience majors with limited mathematical background; general survey courses for students in scientific and engineering fields; advanced courses primarily intended for physics majors; and highly advanced courses primarily intended for prospective graduate students.

In addition to work in industrial, government, or high-technology laboratories in areas of applied physics, students may find opportunities in such fields as biological physics, computer science, geophysics, medical and radiation physics, and engineering. Many physics majors pursue advanced degrees in physics and related fields.

Undergraduates have the option of majoring in biomedical physics. At the most basic level, biomedical physics seeks to understand the role of physical processes occurring on molecular, cellular, or macroscopic scales, in vital biological functions, ranging from the extraction of oxygen from the lungs by red blood cells to the generation of complex electrical signals in the brain and nervous system. At the most practical level, biomedical physics examines how physical principles and modern instrumentation techniques can be used in a rapidly increasing number of medical applications, ranging from imaging tissue structures and organ functions, to detecting and curing diseases, to performing sophisticated surgeries.

An additional option is the BS/MS program in applied physics and engineering, jointly sponsored by the physics department and the Department of Electrical and Computer Engineering (ECE). Students acquire a strong interdisciplinary training in physics, math, and electrical engineering to achieve a BS degree in applied physics and take graduate courses in ECE in the fourth and fifth years that lead directly to an MS degree in electrical engineering.

See pages 433–436 for course descriptions.

BS in Physics

COLLEGE OF ARTS AND SCIENCES BS CORE
REQUIREMENTS FOR NATURAL SCIENCE MAJORS

See page 51 for requirement list.

BREADTH COURSES FOR PHYSICS

Mathematics

Complete the following six courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U345	Ordinary Differential Equations	4 SH
MTH U371	Linear Algebra	4 SH
MTH U481	Probability and Statistics	4 SH

General Engineering

Complete the following course:

GE U111	Engineering Problem Solving and Computation	4 SH
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Chemistry

Complete the following course with corresponding lab:

CHM U211	General Chemistry 1	4 SH
	with CHM U212 Lab for CHM U211	1 SH

Technical Electives

Complete 8 semester hours of intermediate or advanced courses from the following list:

BIO U300 to BIO U699
CHE U301 to CHE U699
CHM U300 to CHM U699
CIV U301 to CIV U699
CS U300 to CS U699
ECE U301 to ECE U699
GEO U300 to GEO U699
MIM U301 to MIM U699
MTH U301 to MTH U699
PHY U300 to PHY U699

PHYSICS MAJOR REQUIREMENTS**Introductory Physics**

Complete the following two courses with corresponding labs:

PHY U161	Physics 1	4 SH
	with PHY U162 Lab for PHY U161	1 SH
or PHY U151	Physics for Engineering 1	4 SH
	with PHY U152 Lab for PHY U151	1 SH
PHY U165	Physics 2	4 SH
	with PHY U166 Lab for PHY U165	1 SH
or PHY U155	Physics for Engineering 2	4 SH
	with PHY U156 Lab for PHY U155	1 SH

Intermediate Physics

Complete the following three courses:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH

Advanced Physics

Complete the following five courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U601	Classical Dynamics	4 SH
PHY U602	Electricity and Magnetism	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH
PHY U617	Quantum Mechanics	4 SH

Elective Course

Complete one course from the following list:

PHY U500	Physics with Computers	4 SH
PHY U611	Astrophysics and Cosmology	4 SH
PHY U613	Particle and Nuclear Physics	4 SH
PHY U614	Condensed Matter Physics	4 SH
PHY U621	Biological Physics 1	4 SH
PHY U623	Medical Physics	4 SH

Senior Capstone and Experiential Education

Complete the following two courses:

PHY U700	Advanced Physics Laboratory 2	4 SH
PHY U954	Experiential Education Directed Study	4 SH

PHYSICS MAJOR CREDIT REQUIREMENT

Complete 95 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Transition students are required to complete 132 total semester hours

Minimum 2.000 GPA required

BS in Applied Physics**COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR NATURAL SCIENCE MAJORS**

See page 51 for requirement list.

BREADTH COURSES FOR APPLIED PHYSICS**Mathematics**

Complete the following four courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U345	Ordinary Differential Equations	4 SH

General Engineering

Complete the following course:

GE U111	Engineering Problem Solving and Computation	4 SH
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Chemistry

Complete the following course with corresponding lab:

CHM U211	General Chemistry 1	4 SH
	with CHM U212 Lab for CHM U211	1 SH

Computer Science

Complete two intermediate or advanced CS courses:

CS U300 to CS U699

Technical Electives

Complete 16 semester hours of intermediate or advanced courses from the following list:

BIO U300 to BIO U699
CHE U301 to CHE U699
CHM U300 to CHM U699
CIV U301 to CIV U699
CS U300 to CS U699
ECE U301 to ECE U699
GEO U300 to GEO U699
MIM U301 to MIM U699
MTH U301 to MTH U699
PHY U300 to PHY U699

APPLIED PHYSICS MAJOR REQUIREMENTS**Introductory Physics**

Complete the following two courses with corresponding labs:

PHY U161	Physics 1	4 SH
with PHY U162	Lab for PHY U161	1 SH
or PHY U151	Physics for Engineering 1	4 SH
with PHY U152	Lab for PHY U151	1 SH
PHY U165	Physics 2	4 SH
with PHY U166	Lab for PHY U165	1 SH
or PHY U155	Physics for Engineering 2	4 SH
with PHY U156	Lab for PHY U155	1 SH

Intermediate Physics

Complete the following three courses:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH

Advanced Physics

Complete the following two courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U602	Electricity and Magnetism	4 SH

Advanced Physics Elective

Complete one course from the following list:

PHY U500	Physics with Computers	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH
PHY U611	Astrophysics and Cosmology	4 SH
PHY U613	Particle and Nuclear Physics	4 SH
PHY U614	Condensed Matter Physics	4 SH
PHY U621	Biological Physics 1	4 SH
PHY U623	Medical Physics	4 SH

Senior Capstone and Experiential Education

Complete the following two courses:

PHY U700	Advanced Physics Laboratory 2	4 SH
PHY U954	Experiential Education Directed Study	4 SH

APPLIED PHYSICS MAJOR CREDIT REQUIREMENT

Complete 91 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Transition students are required to complete 132 total semester hours

Minimum 2.000 GPA required

BS in Biomedical Physics**COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR NATURAL SCIENCE MAJORS**

See page 51 for requirement list.

BREADTH COURSES FOR BIOMEDICAL PHYSICS MAJOR**Mathematics**

Complete the following three courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH

General Engineering

Complete the following course:

GE U111	Engineering Problem Solving and Computation	4 SH
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Biology

Complete the following two courses with corresponding labs:

BIO U111	General Biology 1	4 SH
with BIO U112	Lab for BIO U111	1 SH
BIO U113	General Biology 2	4 SH
with BIO U114	Lab for BIO U113	1 SH

Chemistry

Complete the following course and corresponding lab:

CHM U211	General Chemistry 1	4 SH
with CHM U212	Lab for CHM U211	1 SH

Technical Electives

Complete two intermediate or advanced courses from the following departments:

BIO U300 to BIO U699
CHE U301 to CHE U699
CHM U300 to CHM U699
CIV U301 to CIV U699
CS U300 to CS U699
ECE U301 to ECE U699
GEO U300 to GEO U699
MIM U301 to MIM U699
MTH U301 to MTH U699
PHY U300 to PHY U699

BIOMEDICAL PHYSICS MAJOR REQUIREMENTS**Introductory Physics**

Complete the following two courses:

PHY U161	Physics 1	4 SH
with PHY U162	Lab for PHY U161	1 SH
or PHY U151	Physics for Engineering 1	4 SH
with PHY U152	Lab for PHY U151	1 SH
PHY U165	Physics 2	4 SH
with PHY U166	Lab for PHY U165	1 SH
or PHY U155	Physics for Engineering 2	4 SH
with PHY U156	Lab for PHY U155	1 SH

Intermediate Physics

Complete the following three courses:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH

Advanced Physics

Complete the following four courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U601	Classical Dynamics	4 SH
PHY U602	Electricity and Magnetism	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH

Biomedical Physics

Complete the following four courses:

PHY U621	Biological Physics 1	4 SH
PHY U623	Medical Physics	4 SH
PHY U651	Medical Physics Seminar 1	4 SH
PHY U652	Medical Physics Seminar 2	4 SH

Senior Capstone and Experiential Education

Complete the following two courses:

PHY U700	Advanced Physics Laboratory 2	4 SH
PHY U954	Experiential Education Directed Study	4 SH

BIOMEDICAL PHYSICS MAJOR**CREDIT REQUIREMENT**

Complete 101 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Transition students are required to complete 132 total semester hours

Minimum 2.000 GPA required

BS in Physics and Philosophy**COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR NATURAL SCIENCE MAJORS**

See page 51 for requirement list.

BREADTH COURSES**Mathematics**

Complete the following four courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U343	Differential Equations and Linear Algebra for Engineering	4 SH

PHILOSOPHY REQUIREMENTS FOR DUAL MAJOR**Philosophy Required Courses**

Complete the following four courses:

PHL U115	Introduction to Logic	4 SH
or PHL U215	Symbolic Logic	4 SH
PHL U325	Ancient Philosophy	4 SH
PHL U330	Modern Philosophy	4 SH
PHL U505	Metaphysics	4 SH

Philosophy Seminar

Complete the following seminar:

PHL U902	Great Philosophers Seminar	4 SH
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Additional Electives

Complete four additional electives in philosophy.

PHYSICS REQUIREMENTS FOR DUAL MAJOR**Introductory Physics**

Complete the following two courses with corresponding lab:

PHY U161	Physics 1	4 SH
with PHY U162	Lab for PHY U161	1 SH
or PHY U151	Physics for Engineering 1	4 SH
with PHY U152	Lab for PHY U151	1 SH
PHY U165	Physics 2	4 SH
with PHY U166	Lab for PHY U165	1 SH
or PHY U155	Physics for Engineering 2	4 SH
with PHY U156	Lab for PHY U155	1 SH

Intermediate Physics

Complete the following three courses:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH

Advanced Physics

Complete the following three courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U602	Electricity and Magnetism	4 SH
PHY U617	Quantum Mechanics	4 SH

Physics Elective

Complete one physics elective course.

PHYSICS/PHILOSOPHY INTEGRATIVE REQUIREMENTS

Complete the following two courses:

PHL U510	Philosophy of Science	4 SH
PHY U601	Classical Dynamics	4 SH

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

PHYSICS AND PHILOSOPHY MAJOR CREDIT REQUIREMENT

Complete 98 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

128 total semester hours required

Transition students are required to complete 132 total semester hours

Minimum 2.000 GPA required

BS in Computer Science and Physics

See page 219.

BS in Electrical Engineering and Physics

See page 242.

BS in Environmental Geology and Physics

See page 91.

BS in Geology and Physics

See page 91.

BS in Mathematics and Physics

See page 124.

BS/MS in Applied Physics and Engineering**GPA PROGRESSION REQUIREMENT**

A GPA of 3.500 is required by the end of year three in order to enroll in the graduate ECE courses in year four.

COLLEGE OF ARTS AND SCIENCES BS CORE REQUIREMENTS FOR NATURAL SCIENCE MAJORS

See page 51 for requirement list.

BREADTH COURSES**Mathematics**

Complete the following four courses:

MTH U241	Calculus 1 for Science and Engineering	4 SH
MTH U242	Calculus 2 for Science and Engineering	4 SH
MTH U341	Calculus 3 for Science and Engineering	4 SH
MTH U345	Ordinary Differential Equations	4 SH

General Engineering

Complete the following course:

GE U111	Engineering Problem Solving and Computation	4 SH
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Chemistry

Complete the following course with corresponding lab:

CHM U211	General Chemistry 1	4 SH
	with CHM U212 Lab for CHM U211	1 SH

MAJOR REQUIREMENTS**Introductory Physics**

Complete the following two courses with corresponding labs:

PHY U161	Physics 1	4 SH
	with PHY U162 Lab for PHY U161	1 SH
or PHY U151	Physics for Engineering 1	4 SH
	with PHY U152 Lab for PHY U151	1 SH
PHY U165	Physics 2	4 SH
	with PHY U166 Lab for PHY U165	1 SH
or PHY U155	Physics for Engineering 2	4 SH
	with PHY U156 Lab for PHY U155	1 SH

Intermediate Physics

Complete the following three courses:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH

Advanced Physics

Complete the following four courses:

PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U602	Electricity and Magnetism	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH
PHY U617	Quantum Mechanics	4 SH

Senior Capstone and Experiential Education

Complete the following two courses:

PHY U700	Advanced Physics Laboratory 2	4 SH
PHY U954	Experiential Education Directed Study	4 SH

Engineering Undergraduate Requirements

Complete the following three courses:

ECE U400	Linear Circuits	4 SH
ECE U402	Electronics	4 SH
ECE U464	Linear Systems	4 SH

Engineering Graduate Requirements

Complete the following two courses:

ECE G200	Linear Systems Analysis	4 SH
ECE G204	Applied Probability and Stochastic Processes	4 SH

Engineering Graduate Electives

Complete six courses from the ECE graduate department.

EXPERIENTIAL EDUCATION REQUIREMENT

Complete one course in experiential education. Please see department for approved courses.

APPLIED PHYSICS AND ENGINEERING MAJOR CREDIT REQUIREMENT

Complete 115 semester hours in the major.

GENERAL ELECTIVES

Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

COOPERATIVE EDUCATION

If elected

UNIVERSITY-WIDE REQUIREMENTS

160 total semester hours required

Minimum 3.000 GPA required

Minor in Physics**REQUIRED COURSES**

Complete one of the following sequences:

Physics 1 and 2

PHY U161	Physics 1	4 SH
	with PHY U162 Lab for PHY U161	1 SH
PHY U165	Physics 2	4 SH
	with PHY U166 Lab for PHY U165	1 SH

Physics for Engineering 1 and 2

PHY U151	Physics for Engineering 1	4 SH
	with PHY U152 Lab for PHY U151	1 SH
PHY U155	Physics for Engineering 2	4 SH
	with PHY U156 Lab for PHY U155	1 SH

ELECTIVE COURSES

Complete three courses from the following list:

PHY U303	Modern Physics	4 SH
PHY U305	Thermodynamics and Statistical Mechanics	4 SH
PHY U371	Electronics	4 SH
PHY U600	Advanced Physics Laboratory 1	4 SH
PHY U601	Classical Dynamics	4 SH
PHY U602	Electricity and Magnetism	4 SH
PHY U603	Electromagnetic Waves and Optics	4 SH
PHY U611	Astrophysics and Cosmology	4 SH
PHY U613	Particle and Nuclear Physics	4 SH
PHY U614	Condensed Matter Physics	4 SH
PHY U621	Biological Physics 1	4 SH
PHY U623	Medical Physics	4 SH

GPA REQUIREMENT

2.000 GPA required in the minor

POLITICAL SCIENCE

www.casdn.neu.edu/~polisci

JOHN H. PORTZ, PhD
Professor and Chair

**RUSSELL B. AND ANDRÉE B. STEARNS TRUSTEE
PROFESSOR OF POLITICAL ECONOMY**

Barry Bluestone, PhD

THOMAS P. O'NEILL CHAIR IN PUBLIC LIFE

William Crotty, PhD

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Michael S. Dukakis, JD

COLLEGE OF ARTS AND SCIENCES**DISTINGUISHED PROFESSOR**

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Political science majors study the art and science of politics, the structure and functions of government, political behavior, and public policymaking. Students will learn about the political and policy dimensions of societies, economic systems, and cultures, today and across time, both in the United States and in other nations.

Political science majors can choose from a wide array of courses in American politics, international relations, comparative politics, public administration, and political theory. Majors can follow a general studies path, selecting from among electives as they go along, or they can pursue more structured and more specialized concentrations in law and legal issues, international and comparative politics, or public policy and administration. Most majors participate in the cooperative education program, with placements in local, state, and federal government agencies; law firms; nonprofit institutions; and corporations. Many students complete either a co-op position or an internship with a congressional representative, a senator, a governor, or other elected public servant.

Students may also participate in extracurricular programs designed to expand their leadership ability, such as the Political Science Student Association/Pi Sigma Alpha, Model United Nations, Model Arab League, student government, College Democrats, College Republicans, or other student groups. Many students study in one of the college's international programs, such as the Irish Studies program, which includes an internship in the Irish Parliament. Students also may qualify for the University Honors Program.

A major in political science helps prepare students for law school, graduate school, and careers in the government and the nonprofit sector, as well as for teaching, journalism, legislative or lobbying positions, public relations activities, and work in international corporations. See pages 441–447 for course descriptions.

BA in Political Science**COLLEGE OF ARTS AND SCIENCES****BA CORE REQUIREMENTS**

See page 48 for requirement list.

INTRODUCTION TO COLLEGE

POL U100 College: An Introduction 1 SH