Drexel University

Catalog 2002 2003

Undergraduate Catalog

Drexel University Catalog 2002 2003

The College of Arts and Sciences

The College of Arts and Sciences is committed to providing high-quality education in the humanities, social sciences, sciences, mathematics, and teacher education.

The departments and programs of the College offer the following curricula leading to the Bachelor of Science degree:

- Bioscience and Biotechnology
- Chemistry
- Communication
- History & Politics
- International Area Studies
- Environmental Science
- Mathematics
- Nutrition and Foods
- Physics
- Psychology
- Sociology
- Unified Science

The College also offers students the option of a Bachelor of Arts degree in the following majors:

- Communication (corporate communication track only)
- History & Politics
- International Area Studies
- English
- Psychology/Sociology/Anthropology

Students can select from a variety of four- and five-year major options with co-operative education opportunities for relating academic study to work experience and developing first-job potential.

Bachelor of Arts Degree Programs
The Bachelor of Arts degree provides a broad-based liberal education while allowing students the option of practical application of their studies through Drexel's well-established cooperative education program. (In some cases, four-year options or alternatives to the co-op experience are available.)

The B.A. degree continues the Drexel focus on critical reasoning, a strong grounding in arts and sciences, and effective development of communication skills. The degree is intended to provide a solid liberal arts background for graduate study as well as for professional degrees in such areas as law, public history, foreign service, education, counseling, social work, public health, and medicine.

While the B.A. degree requires more liberal arts courses than the Bachelor of Science degree, it also allows more varied choices in the fulfillment of math and

science requirements. The B.A. degree prepares students for an everchanging and culturally diverse world and will provide them with the tools they will need to be leaders in industry, arts, government, and human services. Drexel's strong advising program helps students learn more about the degree options and which option best matches each student's long-term goals.

Curricular Organization for Science and Mathematics Majors
All Students in the majors in biological sciences, chemistry, mathematics, nutrition and foods, physics, and unified science study essentially the same or similar subjects during the freshman year. This recognizes the fundamental knowledge common to those disciplines; it also allows for transfer between majors at the end of the freshman year without loss of time.

Upper-class students in those disciplines are given the opportunity to take electives in liberal, scientific, and technically related fields.

The flexibility available in the elective programs and the opportunity to complete an academic minor permit students to prepare for continuing studies in graduate or professional school, for work in government or industry, or for a change in educational goals.

Generally the basic requirements in each major are completed prior to the senior year. Thus, for science and mathematics majors, the technical electives in the last year may be selected in some advanced specialty within the specific major, and free electives may be used for enrichment or to prepare for a change of field. Each student's elective program must be approved by and adviser from his or her major department.

Curricular Organization for Humanities and Social Science Majors
Students majoring in the humanities and social sciences complete the same or similar sets of courses in the freshman and sophomore years. Some of these courses (for instance, the humanities sequences) are identical for all students, including science majors, while others may vary by discipline (for instance, Calculus I for majors in the technical and science track of the communication major but Calculus I or Introduction to Analysis I for psychology majors). All students majoring in a humanities or social sciences field are encouraged to take at least one course in their proposed field of concentration in the freshman year. Intensive work in a specific concentration begins in the sophomore year, but in each year after the first, students have an opportunity to take at least one elective course. All humanities and social sciences majors have a significant degree of flexibility, allowing them to complete disciplinary requirements and, through electives, to take a minor or another major or prepare for entry into graduate or professional school.

Majors in Science or Mathematics with Secondary and Elementary Teacher Certification
The School of Education, housed within the College of Arts and Sciences, offers innovative and science-intensive curricula that combine academic majors with appropriate coursework and experiences to satisfy state requirements for certification in biology, chemistry, earth and space sciences, mathematics, physics, and elementary education. Students interested in the teacher education programs should contact the director of the School. Click here for information on teacher education coursework.

Accelerated Program and Bachelor's/Master's Dual Degree Program
The Accelerated Program of the College of Arts and Sciences provides opportunities for highly talented and strongly motivated students to progress

toward their educational goals essentially at their own pace. Primarily through advanced placement, credit by examination, flexibility of scheduling, and independent study, the program makes possible the completeion of the undergraduate curriculum and the master's degree in science disciplines in five years. Students enrolled in this program may take advantage of the five-year Bachelor's/Master's Dual Degree Program described in the Academic Regulations section.

Preprofessional Programs
Students wishing to prepare for admission to professional schools of law, medicine, veterinary medicine, or dentistry may obtain preprofessional counseling and assistance in making application from the Office of Preprofessional Programs, 215-895-2437.

Degree Requirements
Certification for graduation is provided by the individual department or program according to the requirements for each major, which are set forth in subsequent pages. The minimum number of credits required for the degree of Bachelor of Science varies from one department and programd to another but in no case does it exceed 192 credits of academic work with two to six terms of co-operative experience.

The English Language Center
As part of the College of Arts and Sciences, Drexel's English Language Center offers an intensive English program throughout the year. Besides classes in academic skills such as essay writing and oral presentations, the center offers courses in business English, English for academic purposes, computer skills in English, TOEFL preparation, and other subjects. Many undergraduate students begin their studies at Drexel in the English Language Center, particularly if they do not meet minimum TOEFL requirements (see the Special Language Enhancement Program described below).

Interested applicants may call the English Language Center at 215-895-2022; fax: 215-895-6775; email: *elc@drexel.edu*.

The Special Language Enhancement Program
Students who have good academic qualifications but whose TOEFL scores are below the minimum required by the admissions office may be accepted to Drexel through the Special Language Enhancement Program (SLEP). SLEP students will be provided a program that includes English Language study, Drexel courses, and academic advising.

Please contact the English Language Center for more information.

Graduate Programs
The College fo Arts and Sciences offers graduate curricula leading to the Master of Science degree in the following:

- Bioscience and Biotechnology
- Chemistry
- Computational Mathematics
- Environmental Science
- Environmental Policy
- Mathematics
- Food Science
- Human Nutrition
- Physics

- Psychology
- Teacher Education
- Technical and Science Communication

The College of Arts and Sciences also offers the graduate curricula leading to the Doctor of Philosophy degree in the following:

- Bioscience and Biotechnology
- Chemistry
- Mathematics
- Environmental Science
- Physics
- Psychology
- Teacher Education

For additional information, consult the graduate course catalog or contact the College.

Bioscience and Biotechnology

Bachelor of Science Degree: 192.0 credits

The biological sciences encompass many fields. Biologists study the structure and functions of living organisms from the individual cell to the full organism, and collectively to the community level. Discoveries in the biological sciences influence many aspects of our daily lives and have become the foundation of most new developments of the new century. In the past two decades, advances in molecular biology and genetics have been rapid, opening many new, exciting career opportunities in the fields of biotechnology and genetic engineering. Biologists can pursue a variety of options including careers in medicine, dentistry, veterinary medicine or other health-related areas; in research or commercial laboratories; in various private and government agencies; and in teaching. In fact, more than 100 different occupations have been listed for biologists.

The bioscience major resides in the Department of Bioscience and Biotechnology. Students earn a bachelor's degree in the biological sciences and are prepared for technical careers in research or commercial laboratories, or for professional schools or graduate study. Graduates in the biological sciences are in demand and enjoy a high placement rate with competitive salaries. Graduates with a degree in the biological sciences work for pharmaceutical companies, medical research laboratories, or biotechnology companies, or in government laboratories.

The undergraduate curriculum was developed with support from a National Service Foundation grant. Our nationally recognized curriculum emphasizes laboratory experiences in which students work in teams to learn scientific principles by designing focused research projects. During their freshman and sophomore years, majors in biological sciences participate in the Enhanced Bioscience Curriculum (EBE) program, an integrated curricular approach where students spend five hours per week in lab learning how to participate in the scientific profess. This unique curricular approach is extended into the bioscience upper-level required courses in biochemistry, developmental biology, comparative physiology, and advanced cell biology. In addition to the foundation curriculum, with its focus on basic bioscience principles, students select elective courses in their areas of interest. The goal of the program is to give students the knowledge, tools, and skills of the bioscientist necessary to face the challenges of the 21st century.

The course requirement grids shown also identify required support courses in chemistry, physics, mathematics, humanities, and science and human affairs. With proper selection of electives, students can meet teacher certification requirements or complete a minor in another field. Students are encouraged to consult frequently with their academic adviser for curriculum planning.

Co-op/internship employment is an option for biological sciences students. The major offers three distinct plans:

Five-year option with co-op/internship experience: This option allows for the greatest amount of employment experience, with three distinct six-month periods of employment included with studies. After the start of the sophomore year, students study or work through all terms, including summer.

Four-year option with one co-op/internship experience: The degree includes just one six-month period of full-time employment. After the start of sophomore year, students study or work through all terms, including summer.

Four-year option without co-op experience: The degree can be completed in four years without co-op/internship employment. Students are not required to pursue studies during any of the summer terms.

Degree Requirements

Bioscience required courses		Credits
BIO 114	**Bioscience I: Growth of Organisms and Populations**	5.5
BIO 115	**Bioscience II: Organismal Physiology**	5.5
BIO 116	**Bioscience III: Principles of Genetics**	5.5
BIO 205	**Bioscience IV: Molecular and Cellular Biology**	5.5
BIO 206	**Bioscience V: Gene Expression and Function**	5.5
BIO 268	**Vertebrate Developmental Biology**	4.5
BIO 303	**Biochemistry I: Biomolecules**	3.5
BIO 305	**Biochemistry I Laboratory**	2.0
BIO 307	**Biochemistry II: Metabolism**	3.5
BIO 310	**Comparative Physiology**	4.5
BIO 432	**Advanced Cell Biology**	5.0
BIO 460	**Evolution**	3.0
BIO 471	**Seminar in Biological Science**	2.0
	Bioscience electives*	15.0

***Students must select at least five courses from their area of interest.**

Mathematics and statistics courses		Credits
BIO 440	**Biometry**	3.0
BIO 441	**Data Analysis in the Biosciences**	3.0
CS 280	**Special Topics: Bioscience Programming**	4.0
MATH 101	**Introduction to Analysis I**	
or		
MATH 121	**Calculus I**	4.0
MATH 102	**Introduction to Analysis II**	
or		
MATH 122	**Calculus II**	4.0

MATH 239	**Intermediate Calculus**	
or		
MATH 123	**Calculus III**	4.0

Physical sciences courses		**Credits**
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
CHEM 103	**General Chemistry III**	5.0
CHEM 241	**Organic Chemistry I**	4.0
CHEM 242	**Organic Chemistry II**	4.0
CHEM 243	**Organic Chemistry III**	3.0
CHEM 244	**Organic Chemistry I Laboratory**	3.0
CHEM 245	**Organic Chemistry Laboratory II**	3.0
PHYS 480	**Special Topics: Physics for Bioscience I**	4.5
PHYS 480	**Special Topics: Physics for Bioscience II**	4.5

Humanities and social science courses		**Credits**
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
COM 230	**Techniques of Speaking**	3.0
COM 310	**Technical Writing**	3.0
PHIL 251	**Ethics**	3.0
UNIV S101	**The Drexel Experience**	4.0
	Humanities and social sciences electives	6.0
	Science, technology, and human affairs elective	3.0

Other courses		**Credits**
	Free electives*	24.0

***Students can choose from a variety of course offerings to best meet their academic interests. The program also provides opportunities for qualified students to take research credits (through permission of department), allowing them to carry out a research project with a faculty member. CHEM 256 (Physical Chemistry for the Biosciences) is highly recommended as an elective for bioscience majors.**

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Health-Related Preprofessional Programs
Many students have found that a major in biological sciences is an optimal preparation for admission to medical, dental, or veterinary schools and postgraduate study in other health-related fields. Interested students should consult their academic adviser and the Office of Preprofessional Programs in the Career Management Center.

Minor in Biological Sciences
The minor is designed for students who whish to become acquainted with the life sciences while pursuing a major in another area. This option should be particularly useful for students majoring in areas such as chemistry, engineering, physics, or psychology who are interested in admission to medical schools or graduate programs. Students interested in the minor should consult with an academic adviser in the department for help with course selections.

Students must complete 38 credits of coursework as follows:

Required courses		Credits
BIO 114	**Bioscience I: Growth of Organisms**	5.5
BIO 115	**Bioscience II: Organismal Physiology**	5.5
BIO 116	**Bioscience III: Principles of Genetics**	5.5
BIO 204	**Bioscience IV: Molecular and Cellular Biology**	5.5
BIO 206	**Bioscience V: Gene Expression and Function**	5.5
BIO 303	**Biochemistry I: Biomolecules**	3.5
BIO 305	**Biochemistry I Laboratory**	2.0
BIO 460	**Evolution**	3.0
BIO 471	**Seminar in Biological Science**	2.0

Chemistry

Bachelor of Science Degree 191.5 credits

Each student plans a course of study and selects electives in consultation with a Chemistry Department advisor. Students are required to take two courses, or 6 credits, of liberal studies electives and a minimum of 6 credits of technical electives, such as biological science, mathematics, geology, accounting, law, and advanced chemistry. As part of the latter, following the ninth term in college, students often select an integrated three-term sequence of advanced courses in chemistry.

Students who show initiative and laboratory ability are encouraged to select a research problem and/or other advanced courses in chemistry during the junior and senior years. Most graduate courses in chemistry are open to qualified seniors. Prerequisites and descriptions of available graduate courses appear in the graduate catalog.

Some knowledge is required of a foreign language in which a significant body of chemical literature exists. Students generally elect German, French, or Russian.

The major in chemistry is sufficiently flexible to allow students to prepare to teach at either the secondary or the university level. With proper selection of electives, students can meet teacher certification requirements.

Both a five-year co-op degree and a four-year non-co-op degree are offered. In addition, a minor in chemistry is available for students in other majors who desire a strong physical science background; please contact the department for details.

The B.S. degree in chemistry is certified by the American Chemical Society.

Degree Requirements

General education requirements		Credits
ECON 211	**Principles of Economics I (Micro)**	3.0
ECON 212	**Principles of Economics II (Macro)**	3.0
GER 101	**German I***	4.0
GER 102	**German II***	4.0
GER 103	**German III***	4.0
HIST 167	**The 20th-Century World I**	3.0
HIST 168	**The 20th-Century World II**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0

HUM 103	**Techniques of Analysis and Evaluation**	3.0
UNIV S101	**The Drexel Experience**	4.0
	Humanities elective	3.0
	Electives	33.0

***Or another approved language.**

Chemistry requirements		**Credits**
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
CHEM 103	**General Chemistry III**	5.0
CHEM 230	**Quantitative Analysis**	3.0
CHEM 231	**Quantitative Analysis Laboratory**	2.0
CHEM 241	**Organic Chemistry I**	4.0
CHEM 242	**Organic Chemistry II**	4.0
CHEM 243	**Organic Chemistry III**	3.0
CHEM 244	**Organic Chemistry I Laboratory**	3.0
CHEM 245	**Organic Chemistry II Laboratory**	3.0
CHEM 251	**Physical Chemistry I**	3.0
CHEM 346	**Qualitative Organic Chemistry**	5.5
CHEC 352	**Physical Chemistry and Applications II**	4.0
CHEC 353	**Physical Chemistry and Applications III**	4.0
CHEM 354	**Physical Chemistry IV**	3.0
CHEM 357	**Physical Chemistry I Laboratory**	2.5
CHEM 358	**Physical Chemistry II Laboratory**	2.5
CHEM 420	**Molecular Symmetry and Group Theory Applied to Chemistry**	3.0
CHEM 421	**Inorganic Chemistry I**	3.0
CHEM 422	**Inorganic Chemistry II**	3.0
CHEM 423	**Inorganic Chemistry Laboratory**	4.0
CHEM 430	**Analytical Chemistry I**	3.0
CHEM 431	**Analytical Chemistry II**	4.0

Computer/mathematics requirements	**Credits**

CS 170	**Computer Programming**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
MATH 210	**Differential Equations**	4.0

Physics requirements		**Credits**
PHYS 111	**Physics I**	4.5
PHYS 112	**Physics II**	4.5
PHYS 211	**Physics III**	4.5

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Communication

Bachelor of Arts Degree: 182.0 credits
Bachelor of Science Degree: 182.0 credits

All communication majors take a common core of courses that emphasize communication theory and methods. Then, they specialize in one of three concentrations. Students in the corporate communication concentration pursue careers in public relations, corporate training, and corporate communication. Those who choose the technical and science communication concentration go on to work in technical writing, science writing, publishing, and software and hardware documentation. Global journalism students pursue degrees in journalism and news. Many communication graduates also go on to law school, to business school for an MBA, or to graduate school.

Students who elect the corporate communication concentration have the option of pursuing either a Bachelor of Arts degree or a Bachelor of Science degree. Students who elect the technical and science communication concentration must pursue the Bachelor of Science degree. Students in global journalism must complete the requirements for the Bachelor of Arts degree.

The Culture and Communication Department is committed to helping students become broadly educated and professionally competent individuals. Students are exposed to a variety of media and are guided in the development of their interpretive and expressive skills. The department offers majors in communication (with specializations in corporate communication, technical and science communication, and global journalism) and sociology. These majors are described below.

The department also offers minors in anthropology, corporate communication, and sociology, each of which requires 24 credit hours of study.

Corporate Communication Concentration
The corporate communication concentration develops students' abilities to communicate in a variety of organizational settings for a variety of purposes. The curriculum combines communication skills training with study of the corporate world.

Co-operative education opportunities are available with a variety of corporations and nonprofits in such positions as corporate communication specialist, public relations assistant, and newsletter writer.

Degree requirements grids for the Bachelor of Science and Bachelor of Arts programs appear below.

Corporate Communication Degree Requirements, B.S. Program

University requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0

HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Analysis I**	
or		
MATH 121	**Calculus I**	4.0
MATH 102	**Introduction to Analysis II**	
or		
MATH 122	**Calculus II**	4.0
UNIV H101	**The Drexel Experience**	4.0

One of the following courses		**4.0**
BIO 102	**Biology I: Cells and Tissues**	
CHEM 111	**General Chemistry I**	
PHYS 103	**General Physics I**	

One of the following courses		**4.0**
BIO 104	**Biology II: Growth and Heredity**	
CHEM 112	**General Chemistry II**	
PHYS 104	**General Physics II**	

College requirements		**Credits**
ANTH 101	**Cultural Diversity: Introduction to Cultural Anthropology**	
or		
ANTH 110	**The Human Past: An Introduction to Physical Anthropology and Prehistoric Archaeology**	3.0
COM 150	**Mass Media and Society**	3.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
HIST 140	**Europe and the Modern World I**	4.0
HIST 141	**Europe and the Modern World II**	4.0
LIT 202	**Masterworks of Western Literature III**	3.0
LIT 204	**Masterworks of Non-Western Literature II**	3.0
MUSC 130	**Introduction to Music**	3.0
PSCI 100	**Introduction to Political Science**	4.0
PSY 101	**General Psychology**	3.0

SOC 101	**Introduction to Sociology**	3.0
STAT 211	**Quantitative Methods for Research I**	4.0

One of the following courses		**3.0-4.0**
HIST 201	**U.S. History to 1815**	
HIST 202	**U.S. History 1815-1900**	
HIST 203	**The United States Since 1900**	
PSCI 110	**American Government**	

Communication core requirements		**Credits**
COM 111	**Introduction to Corporate Communication**	3.0
COM 210	**Theory and Models of Communication**	3.0
COM 220	**Introduction to Communications Research**	3.0
COM 230	**Techniques of Speaking**	3.0
COM 240	**New Technologies in Communication**	3.0
COM 330	**Professional Presentations**	3.0
COM 340	**Desktop Publishing**	3.0
COM 380	**Special Studies in Communication Theory**	3.0
PHIL 305	**Communication Ethics**	3.0

Concentration requirements		**Credits**
COM 260	**Fundamentals of Journalism**	3.0
COM 270	**Business Communication**	3.0
COM 280	**Public Relations**	3.0
COM 370	**Advanced Business Writing**	3.0
COM 491	**Senior Project in Communication I**	3.0
COM 492	**Senior Project in Communication II**	3.0

Humanities/other program requirements		**Credits**
LING 101	**Introduction to Linguistics**	3.0
MKTG 301	**Introduction to Marketing Management**	5.0

ORGB 300	**Organizational Behavior**	4.0
PHIL 105	**Critical Reasoning**	3.0
	Literature elective	3.0
	Free electives	31.0-33.0

One of the following courses		**3.0**
HIST 220	**History of American Business**	
HIST 222	**A History of Work and Workers in America**	
PSCI 330	**Public Opinion and Propaganda**	
PSCI 335	**Political Communication**	

One of the following courses		**3.0**
PHIL 251	**Ethics**	
PHIL 301	**Business Ethics**	
PHIL 311	**Computer Ethics**	
PHIL 331	**Philosophy and Public Policy**	

Two of the following courses		**6.0**
FMVD 105	**Fundamentals of Video Production**	
FMVD 125	**Basic Television Studio**	
FMVD 210	**Documentary Video Production**	
FMVD 225	**Advanced Television Studio**	
FMVD 230	**Basic Filmmaking**	
FMVD 270	**Screenwriting I**	
FMVD 330	**Advanced Filmmaking**	
PHTO 110	**Photography**	

Corporate Communication Degree Requirements, B.A. Program

University requirements		**Credits**
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
UNIV H101	**The Drexel Experience**	4.0
	Mathematics courses	6.0-8.0
	Science courses	6.0-8.0

College requirements		Credits
	Foreign language courses	8.0
	Humanities and fine arts courses	12.0
	International studies courses	6.0
	Social and behavioral sciences courses	12.0
	Studies in diversity	6.0

Communication core requirements		Credits
COM 111	**Introduction to Corporate Communication**	3.0
COM 210	**Theory and Models of Communication**	3.0
COM 220	**Introduction to Communications Research**	3.0
COM 230	**Techniques of Speaking**	3.0
COM 240	**New Technologies in Communication**	3.0
COM 330	**Professional Presentations**	3.0
COM 340	**Desktop Publishing**	3.0
COM 380	**Special Studies in Communication Theory**	3.0
PHIL 305	**Communication Ethics**	3.0

Concentration requirements		Credits
COM 260	**Fundamentals of Journalism**	3.0
COM 270	**Business Communication**	3.0
COM 280	**Public Relations**	3.0
COM 370	**Advanced Business Writing**	3.0
COM 491	**Senior Project in Communication I**	3.0
COM 492	**Senior Project in Communication II**	3.0

Humanities/other program requirements		Credits
LING 101	**Introduction to Linguistics**	3.0
MKTG 301	**Introduction to Marketing Management**	5.0
ORGB 300	**Organizational Behavior**	4.0
PHIL 105	**Critical Reasoning**	3.0
	Literature elective	3.0
	Free electives	32.0-37.0

One of the following courses		3.0
HIST 220	**History of American Business**	
HIST 222	**A History of Work and Workers in America**	
PSCI 330	**Public Opinion and Propaganda**	
PSCI 335	**Political Communication**	

Two of the following courses		6.0
PHIL 251	**Ethics**	
PHIL 301	**Business Ethics**	
PHIL 311	**Computer Ethics**	
PHIL 331	**Philosophy and Public Policy**	

One of the following courses		3.0
FMVD 105	**Fundamentals of Video Production**	
FMVD 125	**Basic Television Studio**	
FMVD 210	**Documentary Video Production**	
FMVD 225	**Advanced Television Studio**	
FMVD 230	**Basic Filmmaking**	
FMVD 270	**Screenwriting I**	
FMVD 330	**Advanced Filmmaking**	
PHTO 110	**Photography**	

Technical and Science Communication Concentration

In this concentration, students learn to communicate scientific and technical information to various audiences. The program combines courses that develop communication skills with courses that enhance understanding of science and technology.

Co-operative education opportunities are available with a variety of companies and organizations. Students have worked as technical writers, software and hardware documentation specialists, and science writers.

Technical Communication Degree Requirements

University requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Analysis I**	
or		
MATH 121	**Calculus I**	4.0
MATH 102	**Introduction to Analysis II**	
or		
MATH 122	**Calculus II**	4.0
UNIV H101	**The Drexel Experience**	4.0

One of the following courses		4.0
BIO 102	**Biology I: Cells and Tissues**	
CHEM 111	**General Chemistry I**	
PHYS 103	**General Physics I**	

One of the following courses		4.0
BIO 104	**Biology II: Growth and Heredity**	

CHEM 112	**General Chemistry II**	
PHYS 104	**General Physics II**	

College requirements		**Credits**
ANTH 101	**Cultural Diversity: Introduction to Cultural Anthropology**	
or		
ANTH 110	**The Human Past: An Introduction to Physical Anthropology and Prehistoric Archaeology**	3.0
COM 150	**Mass Media and Society**	3.0
CS 170	**Computer Programming**	3.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
HIST 140	**Europe and the Modern World I**	4.0
HIST 141	**Europe and the Modern World II**	4.0
LIT 202	**Masterworks of Western Literature III**	3.0
LIT 204	**Masterworks of Non-Western Literature II**	3.0
MUSC 130	**Introduction to Music**	3.0
PSCI 100	**Introduction to Political Science**	4.0
PSY 101	**General Psychology**	3.0
SOC 101	**Introduction to Sociology**	3.0
STAT 211	**Quantitative Methods for Research I**	4.0

One of the following courses		**3.0-4.0**
HIST 201	**U.S. History to 1815**	
HIST 202	**U.S. History 1815-1900**	
HIST 203	**The United States Since 1900**	
PSCI 110	**American Government**	

Communication core requirements		**Credits**
COM 111	**Introduction to Corporate Communication**	3.0
COM 210	**Theory and Models of Communication**	3.0
COM 220	**Introduction to Communications Research**	3.0

COM 230	**Techniques of Speaking**	3.0
COM 240	**New Technologies in Communication**	3.0
COM 330	**Professional Presentations**	3.0
COM 340	**Desktop Publishing**	3.0
COM 380	**Special Studies in Communication Theory**	3.0
PHIL 305	**Communication Ethics**	3.0

Concentration requirements		**Credits**
COM 310	**Technical Communication**	3.0
COM 320	**Science Writing**	3.0
COM 350	**Message Design and Evaluation**	3.0
COM 410	**Advanced Technical Writing**	3.0
COM 420	**Technical Editing**	3.0
COM 491	**Senior Project in Communication I**	3.0
COM 492	**Senior Project in Communication II**	3.0

Humanities/other program requirements		**Credits**
FMVD 105	**Fundamentals of Video Production**	
or		
FMVD 270	**Screenwriting I**	3.0
HIST 280	**History of Science**	
or		
HIST 285	**Technology in Historical Perspective**	3.0
ISYS 110	**Human-Computer Interaction**	3.0
LING 101	**Introduction to Linguistics**	3.0
LIT 300	**Literature and Society**	3.0
PHIL 105	**Critical Reasoning**	3.0
PHIL 361	**Philosophy of Science**	3.0
	Writing for Visual Media	3.0
	Science electives	8.0
	Free electives	22.0

Global Journalism Concentration

This concentration provides students with the skills and theoretical perspective they need to practice journalism on an international stage. Journalism is an international

business, and the range of potential jobs for graduates grows almost daily. An extension of the program's core curriculum, the concentration hones the student's ability to write and edit while at the same time exposing the student to new and evolving aspects of the field.

Co-operative education opportunities are available with a wide range of media companies in positions including reporter (online and print), editor, assignment editor, public relations assistant, and newsletter writer.

Global Journalism Degree Requirements

University requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
UNIV H101	**The Drexel Experience**	4.0
	Mathematics courses	6.0-8.0
	Science courses	6.0-8.0

College requirements		Credits
	Foreign language courses	8.0
	Humanities and fine arts courses	12.0
	International studies courses	6.0
	Social and behavioral sciences courses	12.0
	Studies in diversity	6.0

Communication core requirements		Credits
COM 111	**Introduction to Corporate Communication**	3.0
COM 150	**Mass Media and Society**	3.0
COM 210	**Theory and Models of Communication**	3.0
COM 220	**Introduction to Communications Research**	3.0
COM 230	**Techniques of Speaking**	3.0
COM 240	**New Technologies in Communication**	3.0
COM 340	**Desktop Publishing**	3.0
COM 380	**Special Studies in Communication Theory**	3.0
PHIL 305	**Communication Ethics**	3.0

Specialized requirements		Credits
COM 260	**Fundamentals of Journalism**	3.0
COM 280	**Public Relations**	3.0
COM 300	**Computer-Assisted Journalism**	3.0
COM 360	**International Communication**	3.0
COM 370	**Advanced Business Writing**	3.0
COM 380	**Special Studies: Writing for the World Wide Web**	3.0
COM 390	**Global Journalism**	3.0
COM 491	**Senior Project in Communication I**	3.0
COM 492	**Senior Project in Communication II**	3.0
	Concentration elective	3.0

Humanities/other program requirements		Credits
ANTH 312	**Approaches to Intercultural Behavior**	3.0
BLAW 340	**International Business Law**	4.0
ECON 342	**Economic Development**	4.0
FMVD 105	**Fundamentals of Video Production**	3.0
FMVD 240	**Film and Video Management**	3.0
IAS 399	**Interdisciplinary Independent Study**	3.0
LING 101	**Introduction to Linguistics**	3.0
LIT 202	**Masterworks of Western Literature III**	3.0
LIT 260	**Literature and Society**	
or		
LIT 325	**Selected Topics in World Literature**	3.0
PHIL 105	**Critical Reasoning**	3.0
PSCI 150	**International Politics**	
or		
PSCI 255	**International Political Economy**	4.0
PSCI 340	**Politics of Developing Nations**	3.0
SOC 220	**Wealth and Power**	
or		
SOC 260	**Classical Social Theory**	3.0
	Free electives	17.0-22.0

Minor in Corporate Communication

The minor in corporate communication is a 24-credit curriculum designed to familiarize students with business issues and communication theory while providing training in print and electronic communication skills. The minor teaches students how organizations communicate effectively with the public and internally, including the media, customers, and employees. The minor thus provides a strong complement for majors that emphasize presentations, interpersonal skills, publicity, and marketing.

Required courses		Credits
COM 111	**Principles of Corporate Communication**	3.0
COM 210	**Theory and Models of Communication**	3.0
COM 270	**Business Communication**	
or		
COM 370	**Advanced Business Writing***	3.0
COM 280	**Public Relations****	
or		
COM 260	**Journalism**	3.0
HIST 220	**History of American Business**	
or		
PHIL 305	**Communication Ethics**	3.0
	One audiovisual skills course	3.0
	Electives***	6.0

*Students who take one of these courses for their major must take the other for the minor.

**Or a comparable course approved by the director of the corporate communication program.

***Two courses from the communication curriculum (see advisor).

English and Philosophy

The Department of English and Philosophy offers a major in literature and minors in literature and philosophy.

English

Bachelor of Arts Degree: 182.0 credits

The English major offers exposure to a variety of literary works and teaches an understanding of the aesthetic, social, historical, and psychological issues that inform these works. All beginning English majors study the relationship between literature and the other humanities. Students may then elect to develop a broad-based course of study of world literatures or pursue a more specialized interest in a genre, a period, or a cross-disciplinary topic. Students may also meet with the director to develop a creative writing track within the major.

Degree Requirements

University requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Analysis and Evaluation**	3.0
UNIV H101	**The Drexel Experience**	4.0
	Any two math courses	6.0-8.0
	Any two science courses	6.0-8.0

College requirements		Credits
	Language courses (any two consecutive courses at least completing level 201)	8.0
	Social and behavioral science courses	12.0
	Humanities and fine arts courses	12.0
	International area studies courses or courses in international literature	6.0
	Studies in diversity (women's studies, African-American studies, Judaic studies, or courses in ethnic literature)	6.0

Other courses		Credits
	Free electives	49.0-50.0

English requirements		Credits
ENGL 200	**Masterworks of Western Literature I**	3.0

ENGL 201	**Masterworks of Western Literature II**	3.0
ENGL 202	**Masterworks of Western Literature III**	3.0
ENGL 203	**Masterworks of Non-Western Literature I**	3.0
ENGL 204	**Masterworks of Non-Western Literature II**	3.0
ENGL 205	**American Traditions in Literature I**	3.0
ENGL 206	**American Traditions in Literature II**	3.0
ENGL 315	**Shakespeare**	3.0
ENGL 399	**Senior Project in Literature**	3.0
FMVD 150	**American Classic Cinema**	3.0
PHIL 101	**Introduction to Philosophy**	3.0

Two of the following courses		**6.0**
ENGL 210	**Readings in Fiction**	
ENGL 215	**Readings in Poetry**	
ENGL 216	**Readings in Drama**	
ENGL 301	**Literature Seminar**	

One of the following courses		**3.0**
ENGL 230	**The Bible and Literature**	
ENGL 235	**Mythology**	

Two of the following courses		**6.0**
FMVD 270	**Scriptwriting**	
FMVD 280	**Copywriting**	
FMVD 285	**Writing for Nonfiction Film and Video**	
WRIT 220	**Creative Nonfiction Writing**	
WRIT 225	**Creative Writing**	
WRIT 301	**Advanced Poetry Writing**	

Four of the following courses		**12.0**
ENGL 310	**Period Studies**	

ENGL 320	**Studies in a Major Author**
ENGL 323	**Studies in Literature and Other Arts**
ENGL 325	**Selected Topics in World Literature**
ENGL 345	**American Ethnic Literature**
ENGL 360	**Literature and Society**

One of the following courses	**3.0**
FMVD 105	**Fundamentals of Video Production**
PHTO 110	**Photography**
THTR 210	**Acting I**
VSST 110	**Introductory Drawing**

Two of the following courses	**6.0**
ARTH 101	**History of Art I**
ARTH 102	**History of Art II**
ARTH 103	**History of Art III**
COM 150	**Mass Media and Society**
FMVD 255	**Hitchcock**
FMVD 262	**Film Comedy**
FMVD 260	**The Western**
LING 101	**Linguistics**
MUSC 130	**Introduction to Music**
THTR 120	**Introduction to Theater**

Creative Writing Courses

The following courses may be taken as replacements for selected literature courses in consultation with the literature director:

Courses		Credits
WRIT 220	**Creative Nonfiction Writing**	3.0
WRIT 225	**Creative Writing**	3.0
WRIT 301	**Advanced Poetry Writing**	3.0

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in English
The English minor provides students from other majors with a more intensive background in literature. Coursework in the minor includes literature from a variety of periods, cultures and genres; it also provides practice in techniques of literary analysis. The courses enrich students' intellectual lives and provide them with skills that are valuable in professional situations.

Students complete 24 credits, distributed as follows:

Courses		Credits
ENGL 203	**Masterworks of Non-Western Literature I**	
or		
ENGL 204	**Masterworks of Non-Western Literature II**	3.0
ENGL 205	**The American Tradition in Literature I**	
or		
ENGL 206	**The American Tradition in Literature II**	3.0

Two of the following courses		**6.0**
ENGL 200	**Masterworks of Western Literature I**	
ENGL 201	**Masterworks of Western Literature II**	
ENGL 202	**Masterworks of Western Literature III**	

Two of the following courses		**6.0**
ENGL 210	**Readings in Fiction**	
ENGL 215	**Readings in Poetry**	
ENGL 216	**Readings in Drama**	
ENGL 301	**Literature Seminar**	

Two of the following courses		**6.0**
ENGL 230	**The Bible and Literature**	
ENGL 235	**Mythology**	
ENGL 240	**Science Fiction**	
ENGL 245	**American Ethnic Literature**	
ENGL 255	**Women and Literature**	
ENGL 260	**Literature and Society**	
ENGL 265	**The Mystery Story**	
ENGL 295	**Special Studies in Literature**	
ENGL 300	**Literature and Science**	
ENGL 310	**Period Studies**	
ENGL 315	**Shakespeare**	

ENGL 320	**Studies in a Major Author**
ENGL 323	**Studies in Literature and the Other Arts**
ENGL 325	**Selected Topics in World Literature**

NOTE: Where a course required for the minor is already required for a student's major, the minor requirement should be replaced with another English elective.

Minor in Philosophy

The minor provides an excellent introduction to the basic themes of Western philosophy while combining the rigor of traditional philosophical inquiry with an interest in practical contemporary problems. The courses constituting the minor impart skills valued in any professional practice, including the skills of conceptual analysis and argument construction, while also providing an introduction to the main ethical issues in the professions.

The minor in philosophy requires the completion of 24 credits (eight courses), as shown below.

Courses		Credits
PHIL 101	**Introduction to Philosophy**	3.0
PHIL 105	**Critical Reasoning**	
or		
PHIL 111	**Beginning Logic**	3.0
PHIL 211	**Metaphysics**	3.0
PHIL 221	**Epistemology**	3.0
PHIL 251	**Ethics**	3.0

One of the following courses		**3.0**
PHIL 301	**Business Ethics**	
PHIL 311	**Computer Ethics**	
PHIL 315	**Engineering Ethics**	
PHIL 321	**Biomedical Ethics**	

One of the following courses		**3.0**
PHIL 231	**Aesthetics**	
PHIL 381	**Philosophy in Literature**	
PHIL 391	**Philosophy of Religion**	

One of the following courses		**3.0**
PHIL 241	**Social and Political Philosophy**	
PHIL 351	**Philosophy of Technology**	
PHIL 361	**Philosophy of Science**	
PHIL 371	**Philosophy of Social Sciences**	

Environmental Science

Bachelor of Science Degree: 188.5 credits

The environmental science program at Drexel University is committed to educating undergraduates for technical careers and graduate study in the diverse areas of environmental science vital to restoration of a clean and healthy environment in the 21st century. The major is designed to provide the student with the broad background preparation in all fields of science needed for effective practice in the fields of environmental science. The curriculum in the environmental science program has been modified both to update it and to provide a flexible program for environmental sciences majors.

The program is designed to prepare students for careers in environmental science, environmental assessment, waste management, teaching, atmospheric science, environmental health, marine science, applied ecology, and biodiversity and conservation. Each student is required to complete the environmental core curriculum, listed below.

Required courses		Credits
BIO 114	**Bioscience I: Growth of Organisms and Populations**	5.5
BIO 115	**Bioscience II: Organismal Physiology**	5.5
BIO 116	**Bioscience III: Molecular Cell Biology**	5.5
BIO 221	**Microbiology**	
or		
ENVR 324	**Microbial Ecology**	3.0-5.0
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
CHEM 103	**General Chemistry III**	5.0
CHEM 230	**Quantitative Analysis**	3.0
CHEM 231	**Quantitative Analysis Laboratory**	2.0
CHEM 241	**Organic Chemistry I**	4.0
CHEM 242	**Organic Chemistry II**	4.0
CHEM 244	**Organic Chemistry Laboratory**	3.0
EGEO 200	**Physical Geology**	3.0
ENVR 260	**Environmental Science and Society I**	3.0

ENVR 261	**Environmental Science and Society I Lab**	1.0
ENVR 262	**Environmental Science and Society II**	3.0
ENVR 263	**Environmental Science and Society II Lab**	1.0
ENVR 284	**Ecology I: Physiological and Population Ecology**	5.0
ENVR 286	**Ecology II: Communities and Ecosystems**	5.0
ENVR 310	**Environmental Data Analysis**	3.0
ENVR 316	**Sanitary Microbiology**	3.0
ENVR 342	**Bioclimatology**	3.0
ENVR 360	**Environmental Movements in America**	3.0
ENVR 460	**Evolution**	3.0
ENVR 480	**Biostatistics**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
PHEV 141	**Atmospheric Science I: Climate and Global Change**	3.0
PHEV 142	**Atmospheric Science I Laboratory**	1.0
PHEV 441	**Issues in Global Change I: Seminar**	2.0
PHEV 442	**Issues in Global Change II: Research**	2.0
PHYS 111	**Physics I**	4.0
PHYS 112	**Physics II**	4.0
PHYS 211	**Physics III**	4.0

Humanities requirements		**Credits**
COM 310	**Technical Communication**	3.0
ECON 211	**Principles of Economics I (Micro)**	3.0
ECON 212	**Principles of Economics I (Macro)**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
UNIV P101	**The Drexel Experience**	4.0

	Electives	9.0

In addition, each student selects 18 to 32 credits of specified courses in one of the following areas of specialization:

Atmospheric science		**Credits**
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
PHEV 143	**Atmospheric Science II**	3.0
PHEV 144	**Atmospheric Science II Laboratory**	1.0
PHEV 346	**Atmospheric Dynamics**	3.0
PHYS 347	**Atmospheric Physics and Remote Sensing**	3.0

Biodiversity and conservation		**Credits**
CIVE 450	**Urban and Regional Planning I**	3.0
ENVR 338	**Biodiversity and Conservation**	3.0
PSCI 100	**Introduction to Political Science**	4.0
	Animal diversity elective	3.0-5.0
	Plant diversity elective	3.0-5.0
	Environmental policy elective	3.0

Ecology		**Credits**
ENVR 330	**Aquatic Ecology**	3.0
ENVR 336	**Terrestrial Ecology**	5.0
ENVR 338	**Biodiversity and Conservation**	3.0
	Animal diversity elective	3.0-5.0
	Plant diversity elective	3.0-5.0

Environmental education		**Credits**
EDUC 310	**Computer Applications in Teaching**	3.0
EDUC 320	**Professional Studies in Instruction**	9.0
EDUC 322	**Evaluation of Instruction**	4.0
EDUC 323	**Diagnostic Teaching**	4.0
EDUC 324	**Current Research in Curriculum and Instruction**	3.0

EDUC 325	**Multimedia in Instructional Design**	3.0
EDUC 410	**Student Teaching (serves as a co-op)**	9.0
ENVR 338	**Biodiversity and Conservation**	3.0
	Environmental science elective	3.0

Environmental health and safety		**Credits**
ENVR 321	**Environmental Health**	3.0
ENVR 331	**Industrial Hygiene I**	3.0
ENVR 332	**Industrial Hygiene II**	3.0
ENVR 333	**Industrial Hygiene Laboratory**	3.0
ENVR 431	**Epidemiology**	3.0
ENVR 436	**Toxicology and Human Physiology**	3.0

Environmental hydrology		**Credits**
CHE 311	**Fluid Flow**	3.0
CIVE 330	**Hydraulics I**	3.0
CIVE 430	**Hydrology**	3.0
EGEO 220	**Engineering Geology**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0

Environmental policy		**Credits**
ECON 351	**Resource and Environmental Economics**	4.0
ENVR 365	**Introduction to Environmental Policy Analysis**	3.0
ENVR 370	**Practice of Resource and Environmental Economics**	3.0
PHIL 341	**Philosophy of the Environment**	3.0
PSCI 100	**Introduction to Political Science**	3.0
SOC 250	**Research Methods I**	3.0
SOC 260	**Classic Social Theory**	3.0
SOC 460	**Contemporary Social Theory**	3.0

Environmental technology	**Credits**

BIO 201	**Human Physiology I**	4.0
BIO 303	**Biochemistry I**	3.5
BIO 305	**Biochemistry I Laboratory**	2.0
BIO 307	**Biochemistry II**	3.5
CHEM 256	**Physical Chemistry for Biological Sciences**	4.5
ENVR 324	**Microbial Ecology**	4.5

Marine science		**Credits**
ENVR 330	**Aquatic Ecology**	3.0
ENVR 690	**Marine Ecology**	3.0
	SEA Semester (off campus)	17.0

This is a special program in cooperation with the Sea Education Association. Students have a unique opportunity to concentrate on deep-water oceanographic studies in Woods Hole, Massachusetts, and on a sailing vessel. Through the rigors of hands-on research and practical seamanship, students will collect and analyze data for an individual research project and obtain advanced knowledge of marine science. The shore component of the SEA semester consists of Maritime Studies, Oceanography, and Nautical Science. The sea component consists of Practical Oceanography I and II.

Additional electives are chosen according to the specialty area in consultation with the student's advisor to give a total of 75.5 credits in environmental science. Other required or elective courses in the humanities, mathematics and other sciences, and general electives make up the total 188.5 credits required for the degree.

Field experience includes quantitative environmental measurements in local aquatic and terrestrial habitats, such as streams, lakes, the Delaware Bay, the Poconos, and the New Jersey Pine Barrens.

Students are required to consult frequently with their academic advisors for curriculum planning. Many of the graduate courses in environmental science are also open to qualified seniors who wish to become familiar with some of the applications in the field. Prerequisites and descriptions of available graduate courses appear in the graduate catalog.

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

History & Politics

Bachelor of Arts Degree: 182.0 credits
Bachelor of Science Degree: 182.0 credits

In addition to the major in history and politics, the department offers six minors, which are described in subsequent sections.

In the major program, required courses in history introduce students to historical interpretations in the specific context of selected time periods, geographic areas, and themes. Introductory courses in political science expose students to the particular approaches and subject matter of the five recognized branches of the discipline. Research methods in history and political science, followed by research seminars during the junior and senior years, complete the core curriculum.

Beyond core introductory and seminar requirements, the department believes the most desirable curriculum offers students a wide degree of flexibility and independence. The curriculum plan permits students to design a course of study that reflects individual interest and meets a wide variety of preprofessional needs, such as pre-law or pre-civil service. This course of study is selected after close, continuing consultation with a faculty advisor chosen by the student or by the department head.

Students have the option of declaring a concentration in history or political science by taking 30 credits of history or political science electives beyond those courses required for the major.

Degree requirements for both the B.A. and B.S. programs are provided below.

Degree Requirements, B.A. Program

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis**	3.0
UNIV H101	**University Experience**	4.0
	Two math courses	6.0-8.0
	Two science courses	6.0-8.0

Foundation requirements		Credits
	Diversity electives	6.0
	Foreign language (must complete level 201)	8.0
	Humanities and arts electives	12.0
	Social science electives	12.0
	International studies electives	6.0
	Free electives	26.0-29.0

Professional requirements		Credits
HIST 161	**Themes in World Civilization I**	3.0
HIST 162	**Themes in World Civilization II**	3.0
HIST 163	**Themes in World Civilization III**	3.0
HIST 201	**U.S. History to 1815**	3.0
HIST 202	**U.S. History 1815-1900**	3.0
HIST 203	**The United States Since 1900**	3.0
HIST 280	**History of Science**	3.0
HIST 301	**The Study of History**	3.0
HIST 332	**Junior Seminar**	3.0
PSCI 120	**History of Political Thought**	4.0
PSCI 210	**The American Political System**	4.0
PSCI 240	**Comparative Politics**	3.0
PSCI 255	**International Political Economy**	4.0
PSCI 300	**Research Methods in Political Science**	4.0
	History and politics diversity elective	3.0
	History and politics international studies elective	3.0
	History and politics electives	24.0

History and politics senior sequence		6.0
HIST 490	**Senior Seminar in History I**	
HIST 491	**Senior Seminar in History II**	
or		
PSCI 490	**Senior Seminar in Political Science I**	
PSCI 491	**Senior Seminar in Political Science II**	

Degree Requirements, B.S. Program

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis**	3.0
UNIV H101	**University Experience**	4.0
	Any 8-credit science sequence	8.0

Math sequence		8.0
MCS 101	**Introduction to Analysis I**	
MCS 102	**Introduction to Analysis II**	
or		
MCS 121	**Calculus I**	
MCS 122	**Calculus II**	

Foundation requirements	Credits

ANTH 101	**Cultural Diversity: Introduction to Cultural Anthropology**	
or		
ANTH 110	**The Human Past: An Introduction to Physical Anthropology and Prehistoric Archaeology**	3.0
COM 150	**Mass Media and Society**	3.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
ENGL 202	**Western Literature III**	3.0
ENGL 204	**Non-Western Literature II**	3.0
MUSIC 130	**Introduction to Music**	3.0
PHIL 105	**Critical Reasoning**	3.0
PSY 101	**General Psychology**	3.0
SOC 101	**Introduction to Sociology**	3.0
	Any 4-credit statistics course	4.0

Professional requirements		**Credits**
HIST 161	**Themes in World Civilization I**	3.0
HIST 162	**Themes in World Civilization II**	3.0
HIST 163	**Themes in World Civilization III**	3.0
HIST 301	**The Study of History**	3.0
HIST 332	**Junior Seminar**	3.0
PSCI 120	**History of Political Thought**	4.0
PSCI 210	**The American Political System**	4.0
PSCI 240	**Comparative Politics**	3.0
PSCI 255	**International Political Economy**	4.0
PSCI 300	**Research Methods in Political Science**	4.0
	Any African, Asian, or Latin American history course	3.0
	History/political science concentration	30.0

Two of the following courses		**6.0**
HIST 201	**U.S. History to 1815**	
HIST 202	**U.S. History 1815-1900**	
HIST 203	**The United States Since 1900**	

History and politics senior sequence		6.0
HIST 490	**Senior Seminar in History I**	
HIST 491	**Senior Seminar in History II**	
or		
PSCI 490	**Senior Seminar in Political Science I**	
PSCI 491	**Senior Seminar in Political Science II**	

Other courses		Credits
	Free electives	38.0

History Concentration

This concentration requires 30 hours of history electives beyond the credits already required for the history-politics major.

Political Science Concentration

This concentration requires 30 credits beyond the credits already required for the history-politics major, chosen from the following categories:

Courses		Credits
Two of the following American politics courses		**6.0**
PSCI 310	**American Political Parties and Pressure Groups**	
PSCI 313	**State and Local Government**	
PSCI 315	**Public Administration**	
PSCI 360	**The Constitution and the Judicial Process**	
PSCI 363	**Civil Liberties**	
PSCI 365	**Politics, Law, and Justice**	
PSCI 370	**Public Policy**	

Two of the following comparative politics courses		6.0
PSCI 240	**Comparative Government**	
PSCI 340	**Politics of Developing Nations**	
PSCI 345	**Comparative Politics of the Middle East**	
PSCI 355	**American Foreign Policy**	
PSCI 358	**Political Economy of Japan**	

Two of the following political theory and/or research methods courses	6.0

PSCI 220	**Ancient and Medieval Political Thought**
PSCI 270	**Problems of Individual Liberty vs.Governmental Authority**
PSCI 323	**Comparative Political Thought**
PSCI 327	**Democratic Theory**
PSCI 329	**Theories of Justice**
PSCI 330	**Public Opinion and Propaganda**
PSCI 400	**Quantitative Analysis in History and Politics**

Four additional courses from the preceding categories	**12.0**

Minor in History

Students are required to take 24 credits of coursework from the following categories:

Courses		Credits
	History-politics electives	15.0-18.0

One of the following history sequences		**6.0-9.0**
HIST 140	**Europe and the Modern World I**	
HIST 141	**Europe and the Modern World II**	
or		
HIST 161	**Themes in World Civilization I**	
HIST 162	**Themes in World Civilization II**	
HIST 163	**General World History**	
or		
HIST 167	**The 20th-Century World I**	
HIST 168	**The 20th-Century World II**	
or		
HIST 201	**U.S. History to 1815**	
HIST 202	**U.S. History 1815-1900**	
HIST 203	**The United States Since 1900**	

Minor in Political Science

Students are required to take 24 credits of coursework from the following categories:

Courses		Credits
	Three of the following courses	12.0
PSCI 110	**American Government**	
PSCI 120	**History of Political Thought**	
PSCI 140	**Introduction to Comparative Political Analysis**	
PSCI 150	**International Politics**	
PSCI 300	**Research Methods in Political Science**	

Four of the following courses		**12.0-13.0**
PSCI 220	**Ancient and Medieval Political Thought**	
PSCI 240	**Comparative Government**	
PSCI 255	**International Political Economy**	

PSCI 270	**Problems of Individual Liberty vs.Governmental Authority**
PSCI 310	**American Political Parties and Pressure Groups**
PSCI 313	**State and Local Government**
PSCI 315	**Public Administration**
PSCI 317	**Legislative Behavior**
PSCI 319	**Executive Behavior**
PSCI 327	**Democratic Theory**
PSCI 329	**Theories of Justice**
PSCI 330	**Public Opinion and Propaganda**
PSCI 340	**Politics of Developing Nations**
PSCI 345	**Comparative Politics of the Middle East**
PSCI 355	**American Foreign Policy**
PSCI 358	**Political Economy of Japan**
PSCI 360	**The Constitution and the Judicial Process**
PSCI 363	**Civil Liberties**
PSCI 365	**Politics, Law, and Justice**
PSCI 370	**Topics in Public Policy**
PSCI 400	**Quantitative Analysis in History and Politics**

Minor in American Studies

American studies is an interdisciplinary approach to studying American life and culture. Drawing on the expertise and methodologies of a variety of subjects, American studies offers students the opportunity to examine their world critically and understand their place in it. American studies is an ideal minor for students planning for graduate work or professional careers in business, engineering, and law because it grounds these practical fields in a strong humanistic tradition.

Students are required to take 24 credits of coursework from the following categories:

Courses		Credits
PSCI 110	**American Government***	4.0

One of the following courses		**3.0**
HIST 104	**Issues in American History to 1877**	
HIST 105	**Issues in American History Since 1877**	
HIST 201	**U.S. History to 1815**	
HIST 202	**U.S. History 1815-1900**	
HIST 203	**The United States Since 1900**	

Two of the following courses		**6.0**
HIST 210	**African-American History in the 19th Century**	
HIST 211	**African-American History in the 20th Century**	
HIST 220	**History of American Business**	
HIST 221	**Labor in the Age of Technology**	
HIST 224	**Women in American History**	
HIST 232	**The American Revolution**	
HIST 234	**The Civil War**	

Two of the following courses	**6.0**

PSCI 310	**American Political Parties and Pressure Groups**
PSCI 313	**State and Local Government**
PSCI 330	**Public Opinion and Propaganda**
PSCI 360	**The Constitution and the Judicial Process**
PSCI 363	**Civil Liberties**
PSCI 365	**Politics, Law, and Justice**

Two of the following courses	**6.0**
ENGL 205	**The American Tradition in Literature I**
ENGL 206	**The American Tradition in Literature II**
ENGL 245	**American Ethnic Literature**
MUSC 336	**History of Jazz**
MUSC 338	**American Popular Music**
SOC 210	**Race and Ethnic Relations**

Or, if a history-politics major, a third course from the PSCI courses listed.

Minor in European Studies

This minor provides students with exposure to the historical, political, social, and cultural development of European civilization. The program focuses on the modern period, but students gain an awareness of the deep historical roots and currents on which the modern experience has been built.

Students are required to take 24 credits of coursework from the following categories:

Courses	**Credits**
One of the following course sequences	**10.0-12.0**
HIST 140	**Europe and the Modern World I**
HIST 141	**Europe and the Modern World II**
PSCI 120	**History of Political Thought**
or	
HIST 140	**Europe and the Modern World I**
HIST 141	**Europe and the Modern World II**
PSCI 140	**Introduction to Comparative Political Analysis**
or	
HIST 141	**Europe and the Modern World II**
PSCI 120	**History of Political Thought**
PSCI 140	**Introduction to Comparative Political Analysis**
or	
HIST 162	**Themes in World Civilization II**
HIST 163	**Themes in World Civilization III**
PSCI 120	**History of Political Thought**
or	
HIST 162	**Themes in World Civilization II**
HIST 163	**Themes in World Civilization III**
PSCI 140	**Introduction to Comparative Political Analysis**

Three of the following courses	**9.0**
HIST 235	**The Great War, 1914-1918**
HIST 236	**World War II**
HIST 241	**Modern France**
HIST 242	**Modern Italy**

HIST 243	**Germany and the World of Adolf Hitler**
HIST 244	**20th-Century Russia and the USSR**
HIST 247	**Modern England (1815 to the Present)**
HIST 251	**Fascism**
HIST 252	**Europe Between the Wars, 1919-1939**

One of the following courses		**3.0**
ARTH 101	**History of Art I: Ancient to Medieval**	
ARTH 102	**History of Art II: Renaissance to Modern**	
ARTH 103	**History of Art III: Early Modern to Postmodernism**	
ENGL 200	**Masterworks of Western Literature I**	
ENGL 201	**Masterworks of Western Literature II**	
ENGL 202	**Masterworks of Western Literature III**	
ENGL 310	**Period Studies**	
ENGL 315	**Shakespeare**	
MUSC 231	**Ancient, Medieval, and Renaissance Music**	
MUSC 233	**Music of the Baroque Era**	
MUSC 235	**18th- and 19th-Century Music**	
MUSC 237	**20th-Century Music**	

Minor in Science, Technology, and Human Affairs

This minor affords students the opportunity to obtain in-depth exposure to the political and social issues related to modern science and technology. The program provides knowledge and skills useful in many areas of professional employment or as preparation for graduate and professional study.

Students are required to take 24 credits of coursework from the following categories:

Courses		**Credits**
HIST 280	**History of Science I**	3.0
HIST 281	**History of Science II**	3.0

Three of the following courses		**9.0**
HIST 220	**History of American Business**	
HIST 285	**Technology in Historical Perspective**	
HIST 292	**Technology in American Life**	
HIST 294	**Technology and the Military**	
PSCI 371	**Science, Technology, and Public Policy**	
HIS 290	**Technology and the World Community**	

Three of the following courses		**9.0**
ANTH 210	**Worldview: Science, Religion, Magic**	
ENGL 255	**Women and Literature**	
ENGL 300	**Literature and Science**	
PHIL 351	**Philosophy of Technology**	
PHIL 361	**Philosophy of Science**	
SOC 110	**Sociology of the Future**	

Minor in World History and Politics

This minor introduces students to the historical and political development of societies beyond the American and European context. The 20th-century experiences of decolonization, modernization, and development in Africa, Asia, Latin America, and the Islamic world are given special attention.

Students are required to take 24 credits as follows:

Courses		Credits
One of the following courses		**3.0**
HIST 141	**Europe and the Modern World, 1871-Present**	
HIST 163	**Themes in World Civilization III**	
HIST 167	**The 20th-Century World I**	
HIST 168	**The 20th-Century World II**	
Two of the following courses		**6.0**
HIST 238	**The Vietnam War**	
HIST 263	**The World and China**	
HIST 264	**East Asia in Modern Times**	
HIST 270	**Introduction to Latin American History**	
HIST 271	**History of Mexico**	
Three of the following courses		**9.0-10.0**
PSCI 150	**International Politics**	
PSCI 240	**Comparative Government**	
PSCI 323	**Comparative Political Thought**	
PSCI 340	**Politics of Developing Nations**	
PSCI 345	**Comparative Politics of the Middle East**	
PSCI 355	**American Foreign Policy**	
PSCI 358	**Political Economy of Japan**	
One course each from two of the following sequences		**6.0**
ENGL 203	**Masterworks of Non-Western Literature I**	
ENGL 204	**Masterworks of Non-Western Literature II**	

ENGL 325	**Selected Topics in World Literature**

ECON 340	**International Business**
ECON 342	**Economic Development**

ANTH 101	**Cultural Diversity: Introduction to Cultural Anthropology**
ANTH 210	**Worldview: Science, Religion, Magic**
ANTH 310	**Societies in Transition: The Impact of Modernization and the Third World**
SOC 330	**Developing Nations and the International Division of Labor**

MUSC 331	**World Musics**
	Appropriate art course

International Area Studies

Bachelor of Arts Degree: 182.0 credits
Bachelor of Science Degree: 182.0 credits

The Department of International Studies and Modern Languages offers both a B.A. and a B.S. in international area studies and minors in international area studies and in the seven languages—Chinese, French, German, Italian, Japanese, Russian, and Spanish—that it offers.

International area studies is a language-based interdisciplinary major designed to prepare students for careers in the international arena. It combines a comprehensive liberal arts background with a specialization in the politics, history, culture, and values of a major world area, as determined by the language or languages studied, and substantive coursework in international business, marketing, and economics. Area specializations include Asian studies, European studies, and Latin American studies.

Students majoring in the program study one or more languages as part of their area specialization, and they may qualify for the University's advanced-level Certification of Proficiency in their target language or languages. French, German, Italian and Spanish are the Western languages available; non-Western languages include Chinese, Japanese, and Russian. The major enrolls a number of students from abroad as well as students who lived or studied in Europe, Latin America, or Asia during high school.

Drexel Abroad programs give international area studies students the option of fall-term study programs in Brussels, Bonn, Berlin, Madrid, Paris, and London. The programs feature academic internships with national legislatures, the European Parliament, international law firms and nongovernmental service agencies, and multinational corporations. Drexel Abroad programs are also available in China, Japan, Russia, and Costa Rica. Students in the major generally take co-operative education positions with international service organizations, law firms, investment concerns, and multinational corporations, both in the United States and abroad. In addition, students may elect independent study or study-internships abroad as partial fulfillment of co-operative education requirements.

The major offers both Bachelor of Arts and Bachelor of Science degrees. The B.A. degree, which requires additional courses in liberal arts and languages, provides the best preparation for entry-level careers in government, public relations, international advertising, and service agencies. The B.A. is also recommended for graduate study in fields such as law, international relations, public policy, political science, sociology, history, and economics. The B.S. degree requires additional coursework in international business, economics, and marketing. It prepares students for careers in international marketing, investment, and communications, and for graduate admission to MBA programs.

Career placements include entry-level international marketing and communications positions with national and multinational business concerns in the United States and abroad. Other placements are with public and private international service organizations, advertising, and investment concerns, the Peace Corps, and local and national governmental agencies.

Graduate admissions are in international relations, government, international law, public policy, the humanities, and MBA programs. Recent graduates have pursued advanced study at Yale, Harvard, Georgetown, Johns Hopkins, Cornell, Columbia, American University, the University of California, the Monterey Institute, the University of Pennsylvania, Drexel University, and the Woodrow Wilson School at Princeton University. International graduate admissions include the London School of Economics, the University of London, and Cambridge University in Britain; the Free University of Bonn and the University of Mannheim in Germany; the College of Europe in Belgium; and Ben Gurion University in Israel.

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Degree Requirements, B.A. Program

University requirements		Credits
CS 161	**Introduction to Computing**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
UNIV H101	**The Drexel Experience**	4.0

Two of the following math courses		8.0
MATH 101	**Introduction to Analysis I**	
MATH 102	**Introduction to Analysis II**	
MATH 119	**Mathematics for Design**	
MATH 279	**Special Topics in Mathematics (self-paced)**	

One of the following science sequences		6.0
PHEV 141	**Atmospheric Science I**	
PHEV 143	**Atmospheric Science II**	
or		
ENVR 260	**Environmental Science and Society I**	
ENVR 262	**Environmental Science and Society II**	

College requirements		Credits
ANTH 101	**Cultural Diversity**	3.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
HIST 161	**Themes in World Civilization I**	3.0
HIST 162	**Themes in World Civilization II**	3.0
HIST 163	**Themes in World Civilization III**	3.0
LIT 202	**Masterworks of Western Literature III**	3.0
LIT 204	**Masterworks of Non-Western Literature II**	
or		
LIT 325	**Area Literature**	3.0
PHIL 105	**Critical Reasoning**	3.0
PSCI 150	**International Politics**	4.0
PSY 101	**General Psychology**	3.0
SOC 250	**Research Methods**	3.0
SOC 260	**Classical Social Theory**	3.0

Modern languages and literatures

Western languages: French, German, Italian, and Spanish	
101-201	**Reading, writing and, speaking levels I-IV**
202-203	**Advanced Conversation and Composition**
311-313	**Stylistics**
332, 333	**Literature**
351, 353	**Business and Professional**
371, 471	**Civilization**
399, 499	**Special Topics**

Non-Western languages: Chinese, Japanese, and Russian	
101-103	**Reading, writing, and speaking levels I-III**
201-203	**Intermediate reading, writing, and speaking levels IV-VI**
301-303	**Advanced reading, writing, and speaking levels VII-IX**
411	**Stylistics**

RUSS 499	**Advanced Seminar in Russian Literature**	

*** Exit-level requirement: (1) minimum of 33 credits in a single language or (2) completion of level 303/313 or (3) grade of B or better on Certification of Proficiency examination.**

Patterns of Civilization

Core Curriculum: Students take each of the following courses

IAS 359	**Culture and Values**	3.0
IAS 360	**Civilization**	3.0
WMST 240	**Cross-Cultural Women's Studies**	3.0
Area-specific courses and electives		
Students select 15 credits from the following courses, with at least one course from each section		15.0
Literature		
LIT 200	**Masterworks of Western Literature I**	
LIT 201	**Masterworks of Western Literature II**	
LIT 250	**Great Themes in Literature II**	
LIT 315	**Shakespeare**	
LIT 323	**Studies in Literature and Other Arts**	
LIT 325	**Area Literature (French, Spanish, or Latin American)**	
LIT 330	**The Bible and Literature**	
LIT 335	**Mythology**	
LIT 360	**Literature and Society**	
FREN 431	**Special Studies in Advanced French Literature**	
GER 431	**Special Studies in Advanced German Literature**	
ITAL 431	**Special Studies in Advanced Italian Literature**	
SPAN 431	**Special Studies in Advanced Spanish Literature**	
RUSS 431	**Introduction to Russian Literature**	
Applied philosophy		
PHIL 101	**Beginning Logic**	
PHIL 201	**History of Western Philosophy I**	
PHIL 202	**History of Western Philosophy II**	
PHIL 203	**History of Western Philosophy III**	
PHIL 231	**Aesthetics**	
PHIL 241	**Social and Political Philosophy**	
PHIL 251	**Ethics**	

PHIL 301	**Business Ethics**
PHIL 331	**Philosophy and Public Policy**
PHIL 341	**Philosophy of the Environment**
PHIL 391	**Philosophy of Religion**

Music, art, and media	
ARTH 101	**History of Art I**
ARTH 102	**History of Art II**
ARTH 103	**History of Art III**
ARTH 495	**Asian Art**
COM 150	**Mass Media and Society**
MUSC 130	**Introduction to Music**

Historical, Social, and Political Framework

Core Curriculum: Students take each of the following courses

		Credits
ANTH 312	**Intercultural Behavior**	3.0
PSCI 243	**Economic Geography**	3.0
PSCI 367	**International Law**	3.0
SOC 330	**Developing Nations**	3.0
or		
ANTH 310	**Societies in Transition**	
	Area-specific courses and electives	
	Students select 15 credits from the following courses, with at least two area-specific history and politics courses	15.0

Area-specific history and politics	
HIST 209	**The U.S. and Central America**
HIST 241	**Modern France**
HIST 242	**Modern Italy**
HIST 243	**Germany and the World of Adolf Hitler**
HIST 244	**20th-Century Russia and the USSR**
HIST 247	**Modern England**
HIST 248	**History of Spain**
HIST 251	**Fascism**
HIST 252	**Europe Between the Wars, 1919-1939**
HIST 263	**The World and China**

HIST 264	**East Asia in Modern Times**
HIST 270	**Introduction to Latin American History**
HIST 271	**History of Mexico**
PSCI 357	**The European Union**
PSCI 358	**Political Economy of Japan**

International social and political systems

ANTH 210	**Worldview: Science, Religion, and Magic**
ANTH 212	**World Ethnography**
ANTH 410	**Cultural Theory**
PSCI 323	**Comparative Political Thought**
PSCI 365	**Politics, Law, and Justice**
SOC 220	**Wealth and Power**
SOC 310	**Political Sociology**
SOC 435	**Organization of American States**

International politics

HIST 235	**The Great War: 1914-1918**
HIST 236	**World War II**
HIST 238	**The Vietnam War**
HIST 252	**Europe Between the Wars**
HIST 290	**Technology and the World Community**
PSCI 240	**Comparative Government**
PSCI 245	**Introduction to the 20th-Century Middle East**
PSCI 255	**International Political Economy**
PSCI 345	**Comparative Politics of the Middle East**
PSCI 355	**American Foreign Policy**

The Economic and Business Dimension
Core Curriculum: Students take each of the following courses

		Credits
COM 270	**Business Communication**	3.0
or		
COM 260	**Fundamentals of Journalism**	
INTB 334	**International Trade**	3.0
PHIL 335	**Global Ethical Issues**	3.0

Business Sequence Option

Students take at least two courses from one of the following sequences 7.0-9.0

International Economics Sequence		
ECON 301	**Microeconomics**	
ECON 321	**Macroeconomics**	
ECON 342	**Economic Development**	
ECON 344	**Comparative Economic Systems**	
or		
International Marketing Sequence		
ECON 340	**International Business**	
INTB 332	**Multinational Corporations**	
MKTG 301	**Introduction to Marketing Management**	
MKTG 322	**Advertising and Management**	
MKTG 351	**Marketing for Nonprofit Organizations**	
MKTG 357	**International Marketing**	
	General electives:	8.0-24.0

Degree Requirements, B.S. Program

University requirements		**Credits**
CS 161	**Introduction to Computing**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Analysis I**	4.0
MATH 102	**Introduction to Analysis II**	4.0
UNIV H101	**The Drexel Experience**	4.0

One of the following science sequences **6.0-8.0**

PHEV 141	**Atmospheric Science I**	
PHEV 143	**Atmospheric Science II**	
or		
ENVR 260	**Environmental Science and Society I**	
ENVR 262	**Environmental Science and Society II**	

or	
BIO 102	**Biology I**
BIO 104	**Biology II**
or	
CHEM 111	**Chemistry I**
CHEM 112	**Chemistry II**

College requirements		**Credits**
ANTH 101	**Cultural Diversity**	3.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
HIST 161	**Themes in World Civilization I**	3.0
HIST 162	**Themes in World Civilization II**	3.0
HIST 163	**Themes in World Civilization III**	3.0
LIT 202	**Masterworks of Western Literature III**	3.0
LIT 204	**Masterworks of Non-Western Literature II**	
or		
LIT 325	**Area Literature**	3.0
MUSC 331	**World Musics**	3.0
PHIL 105	**Critical Reasoning**	3.0
PSCI 150	**International Politics**	4.0
PSY 101	**General Psychology**	3.0
SOC 250	**Research Methods**	3.0
SOC 260	**Classical Social Theory**	3.0

Modern languages and literatures **Western languages: French, German, Italian, and Spanish**	
101-201	**Reading, writing and, speaking levels I-IV**
202-203	**Advanced Conversation and Composition**
311-313	**Stylistics**
332, 333	**Literature**
351, 353	**Business and Professional**

371, 471	**Civilization**
399, 499	**Special Topics**

Non-Western languages: Chinese, Japanese, and Russian

101-103	**Reading, writing, and speaking levels I-III**
201-203	**Intermediate reading, writing, and speaking levels IV-VI**
301-303	**Advanced reading, writing, and speaking levels VII-IX**
411	**Stylistics**
RUSS 499	**Advanced Seminar in Russian Literature**

*** Exit-level requirement: (1) minimum of 33 credits in a single language or (2) completion of level 303/313 or (3) grade of B or better on Certification of Proficiency examination.**

Patterns of Civilization
Core Curriculum

IAS 359	**Culture and Values**	3.0
	Area-specific courses and electives **Students select 15 credits from the following courses, with at least one course from each section**	15.0

English

LIT 200	**Masterworks of Western Literature I**
LIT 201	**Masterworks of Western Literature II**
LIT 250	**Great Themes in Literature II**
LIT 315	**Shakespeare**
LIT 323	**Studies in Literature and Other Arts**
LIT 325	**Area Literature (French, Spanish, or Latin American)**
LIT 330	**The Bible and Literature**
LIT 335	**Mythology**
LIT 360	**Literature and Society**
FREN 431	**Special Studies in Advanced French Literature**
GER 431	**Special Studies in Advanced German Literature**
ITAL 431	**Special Studies in Advanced Italian Literature**
SPAN 431	**Special Studies in Advanced Spanish Literature**
RUSS 431	**Introduction to Russian Literature**

Applied philosophy

PHIL 101	**Beginning Logic**
PHIL 201	**History of Western Philosophy I**

PHIL 202	**History of Western Philosophy II**
PHIL 203	**History of Western Philosophy III**
PHIL 231	**Aesthetics**
PHIL 241	**Social and Political Philosophy**
PHIL 251	**Ethics**
PHIL 331	**Philosophy and Public Policy**
PHIL 335	**Global Ethical Issues**
PHIL 341	**Philosophy of the Environment**
PHIL 391	**Philosophy of Religion**

Music, art, and media	
ARTH 101	**History of Art I**
ARTH 102	**History of Art II**
ARTH 103	**History of Art III**
ARTH 495	**Asian Art**
COM 150	**Mass Media and Society**
MUSC 130	**Introduction to Music**

Historical, Social, and Political Framework

Core Curriculum: Students take each of the following courses

		Credits
PSCI 243	**Economic Geography**	3.0
PSCI 367	**International Law**	3.0
SOC 330	**Developing Nations**	3.0
or		
ANTH 310	**Societies in Transition**	
	Area-specific courses and electives	
	Students select 18 credits from the following courses, with at least two area-specific history and politics courses	18.0

Area-specific history and politics	
HIST 209	**The U.S. and Central America**
HIST 241	**Modern France**
HIST 242	**Modern Italy**
HIST 243	**Germany and the World of Adolf Hitler**
HIST 244	**20th-Century Russia and the USSR**
HIST 247	**Modern England**

HIST 248	**History of Spain**
HIST 251	**Fascism**
HIST 252	**Europe Between the Wars, 1919–1939**
HIST 263	**The World and China**
HIST 264	**East Asia in Modern Times**
HIST 270	**Introduction to Latin American History**
HIST 271	**History of Mexico**
PSCI 357	**The European Union**
PSCI 358	**Political Economy of Japan**

International social and political systems

ANTH 210	**Worldview: Science, Religion, and Magic**
ANTH 212	**World Ethnography**
ANTH 410	**Cultural Theory**
PSCI 323	**Comparative Political Thought**
PSCI 365	**Politics, Law, and Justice**
SOC 220	**Wealth and Power**
SOC 310	**Political Sociology**
SOC 435	**Organization of American States**

International politics

HIST 235	**The Great War: 1914-1918**
HIST 236	**World War II**
HIST 238	**The Vietnam War**
HIST 252	**Europe Between the Wars**
HIST 290	**Technology and the World Community**
PSCI 240	**Comparative Government**
PSCI 245	**Introduction to the 20th-Century Middle East**
PSCI 255	**International Political Economy**
PSCI 345	**Comparative Politics of the Middle East**
PSCI 355	**American Foreign Policy**

The Economic and Business Dimension

Core Curriculum: Students take each of the following courses

		Credits
COM 270	**Business Communication**	3.0
HIST 220	**History of American Business**	3.0
INTB 334	**International Trade**	3.0
PHIL 301	**Business Ethics**	3.0

Business Sequence Options

Students take all of the courses in one of the following sequences, with those interested in international business careers being encouraged to take both sequences **12.0**

International Economics Sequence

ECON 301	**Microeconomics**
or	
ECON 321	**Macroeconomics**
ECON 342	**Economic Development**
ECON 344	**Comparative Economic Systems**

International Marketing Sequence

ECON 340	**International Business**
INTB 332	**Multinational Corporations**
MKTG 301	**Introduction to Marketing Management**
MKTG 357	**International Marketing**

General electives: 9.0-23.0 credits

Drexel Abroad Courses

Available in junior or senior year with departmental approval; courses are used to fulfill IAS degree requirements in both the B.A. and B.S. programs.

		variable credits
Brussels, Belgium		
	European Union Institutions	
	The European Union and the World	
	Business and European Union Affairs	
	Independent research project	
	Intensive French language study	

Bonn, Germany	**Politics in Reunited Germany** **German Art and Literature** **Independent research project** **Intensive German language study**
Berlin, Germany	**Politics in Reunited Germany** **European Integration and Cooperation** **Independent research project** **Intensive German language study**
London, U. K.	**British Politics** **European International Relations** **Business and Commercial Aspects of the EU** **Modern European Art** **Independent research project**
Madrid, Spain	**Contemporary Spain** **Spanish Contemporary Novel** **Spanish Art in the Prado Museum** **Spanish Themes** **Independent research project** **Intensive Spanish language study**
Paris, France	**French Culture and Society** **The Changing French Economy** **French History and Identity** **Independent research project** **Intensive French language study**
San Juan, Costa Rica	**Comparative Political Systems** **Development and Environment** **Globalization and Economic Adjustment** **Human Development** **Social Policy and Poverty** **International Relations** **Intensive Spanish language study**
St. Petersburg, Russia	**Intensive Russian language study** **19th- and 20th-Century Russian Literature** **Russian Media Studies**
Beijing and Nanking, China	**Intensive Chinese language study** **Contemporary Chinese Studies** **Chinese Politics** **Chinese Culture and Society**
Tokyo, Japan	**Intensive Japanese language study** **Japanese History**

Japanese Art
Japanese Literature

Minor in International Area Studies

The international area studies minor provides a cross-cultural, interdisciplinary frame of reference for students in other disciplines who are interested in careers in the international sector. The minor requires 24 credits, 12 of which must be in a designated geographical area of focus as determined by the language studied. Language study through level 201 is a prerequisite for the minor.

Prerequisite: completion of Level 201 in a language

Core requirements		Credits
IAS 359	**Culture and Values**	3.0
PSCI 243	**Economic Geography**	3.0
INTB 334	**International Trade**	
or		
INTB 336	**International Money and Finance**	3.0
ECON 340	**International Business**	
or		
MKTG 343	**International Marketing**	3.0
Area studies electives		**12.0**
	Language courses at level 312 and above and/or courses in literature, history, politics, social theory, and business in the area of specialization	

Modern Languages

The programs in modern languages offer beginning, intermediate, and advanced coursework and a language minor in Chinese, French, German, Italian, Japanese, Russian, and Spanish. Minors in these languages are also available. All courses are oral-intensive, with additional hours required in the Language Laboratory, and include individual oral examinations at the end of each term.

In Western languages, enrollments are limited to 15 to 18 students in the first three years of study; fourth-year courses use a seminar format, with a usual enrollment of four to eight students. Chinese, Japanese, and Russian are taught in a tutorial or "self-instructional" format, with enrollments limited to three to six students. Examinations in these languages are primarily oral and are administered by external examiners appointed by the University. All instructors in Chinese, Japanese, and Russian and most instructors in Western languages are native speakers.

Language study is open to all students in the University, and validation of minimal language competence is required for co-operative education placement abroad in countries where English is not the national language. Study for two consecutive terms or through level 103 is the minimum requirement for the B.A. degree, but additional language course work is required by most departments offering this degree.

Students are placed in language courses in accordance with language placement

testing administered during freshman orientation and at the beginning of the fall term. Students who do not take advantage of this option must comply with the department's enrollment guidelines.

Certification of Proficiency

The University offers an advanced-level Certification of Proficiency in Western language, based on successful completion of a series of written examinations and an "advanced" rating on the ACTFL oral examination.

Language Minors

Requirements, Western languages	Credits
24 credits of language study above the 103 level	24.0
Certification of Proficiency	
Minor thesis in the target language (3.0-4.0 credits possible)	
Oral defense of the minor thesis	

Course options (subject to placement level)	
201-203	**Advanced Conversation and Composition**
311-313; 411	**Stylistics; Advanced Stylistics**
332; 333	**Literature; Advanced Studies in Literature**
351	**Business and the Professions**
451	**Advanced Topics in Business and Professions: European Union**
371; 471	**Civilization; Advanced Studies in Civilization**
399; 499	**Special Topics: Literature; Business and Civilization***

***Special topics courses may be repeated for credit.**

Requirements, non-Western languages	Credits
24 credits of language study above the 103 level	24.0
Minor thesis in the target language (3.0-4.0 credits possible)	
Oral defense of the minor thesis	

Course options (subject to placement level)	
201-202	**Advanced reading, writing, and speaking, Levels IV-VI**
301-303	**Stylistics, Levels VII-IX**
RUSS 499	**Advanced Seminar in Russian Literature**

Mathematics

Bachelor of Science Degree: 183.5 credits

Mathematics is a discipline devoted to developing methods for analyzing and solving problems in science, engineering, computer science, and finance, among others. The mathematics program at Drexel provides a supportive learning environment in which students obtain a firm grounding in the core areas of mathematics and apply this knowledge to problems encountered in a technological society.

Mathematics majors may choose a four-year internship program or a five-year co-operative education program. The program is flexible, and students are encouraged to study in related fields that complement their work in mathematics, such as actuarial science, decision sciences, statistics, economics, finance, or computer science. This enhances the student's career prospects and chances for academic success if graduate school is contemplated. In addition, students may obtain teacher certification while completing a full mathematics major. Dual majors are common in mathematics/computer science and mathematics/physics, and minors in related disciplines are available. Students interested in a dual major, a minor, or the four-year internship program should consult with their advisor or contact the assistant department head.

Degree Requirements

General education requirements		Credits
COM 310	**Technical Writing**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
UNIV H101	**The Drexel Experience**	4.0
	Economics elective	3.0
	History elective	3.0
	Humanities electives	9.0
	Social sciences elective	3.0
	Economics/history/social sciences electives	9.0
	Free electives	29.0

Science requirements		Credits
BIO 102	**Biology I: Cells and Tissues**	4.0
CHEM 101	**General Chemistry I**	4.0
PHYS 111	**Physics I**	4.5

Mathematics requirements		Credits
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
MATH 210	**Differential Equations**	4.0
MATH 220	**Techniques of Proof**	3.0
MATH 221	**Discrete Mathematics**	3.0
MATH 300	**Numerical Analysis**	4.0
MATH 311	**Probability and Statistics I**	4.0
MATH 312	**Probability and Statistics II**	4.0
MATH 331	**Abstract Algebra**	4.0
MATH 401	**Modern Analysis**	3.0
	Mathematics electives	21.0

Mathematics and applied fields		Credits
	Additional math electives or applied fields electives (see department for list)	25.0

Computer science requirements		Credits
CS 171	**Computer Programming I**	3.0
CS 172	**Computer Programming II**	3.0

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in Mathematics

The minor in mathematics consists of a core requirement of six courses and at least 18 credits of electives from a specified group of mathematics courses, for a total of 41 credits. Please should consult the department for additional information.

Courses	Credits

MATH 121	**Calculus I***	4.0
MATH 122	**Calculus II***	4.0
MATH 123	**Calculus III***	4.0
MATH 200	**Calculus IV***	4.0
MATH 201	**Linear Algebra***	4.0
	Electives	18.0

***Or equivalent.**

Nutrition and Foods

Bachelor of Science Degree: 180.0 credits

Nutrition and foods includes the study of foods as nutrient sources and the role of nutrients for humans at the cellular, organ system, and complete human levels. Together with the composition, treatment, and metabolism of foods, this major emphasizes the relationship among nutrition, safety, and function of food components as they are affected by processing, production, and preservation, and by metabolic function. The regulatory, chemical, and microbiological aspects of foods are stressed.

The program in nutrition and foods requires four years of study, with 11 terms of classroom work and two terms of co-op experience. The curriculum is designed to provide a sound basis for careers in dietetics and the application of the principles of nutrition and food science to the nutritional care of individuals and groups—such as in school food service or community nutrition—or in the food and pharmaceutical industries. Students are prepared to work as dietitians in hospitals and nursing care facilities, or enter technical positions in food-product control and development, pharmaceutical and food-ingredient development and function, institutional food-service management, and other nutrition- and food-related service fields.

The study of the biochemical nature of nutrients and foods, their interaction with the environment, and their eventual metabolic fate is a strong career path for more research-minded students and provides a unique base for graduate study. The curriculum has been approved by the Council on Education Division of the Education Accreditation/Approval of the American Dietetic Association as a Didactic Program in Dietetics. With appropriate electives, it provides the premedical course recommended by leading medical schools.

Co-op/internship employment is an option for nutrition and foods students. The major offers two distinct plans:

Four-year option with co-op/internship experience: The degree includes one six-month and one three-month period of full-time employment. After the start of the sophomore year, students study or work through all terms, including summer.

Four-year option without co-op experience: The degree can be completed in four years without co-op/internship employment. Students are not required to pursue studies during any of the summer terms.

Degree Requirements

Required NFS courses		Credits
NFS 101	**Introduction to Nutrition and Foods**	3.0
NFS 150	**Foods I: Components and Properties**	3.0
NFS 152	**Foods II: Formulations and Interactions**	3.0
NFS 200	**Nutrition I: Principles of Nutrition**	4.0
NFS 203	**Nutrition II: Nutrition in the Life Cycle**	4.0
NFS 265	**Professional Issues in Nutrition and Foods**	2.0

NFS 275	**Quantity Foods I**	3.0
NFS 276	**Quantity Foods II**	3.0
NFS 345	**Foods and Nutrition of World Cultures**	3.0
NFS 365	**Nutrition Laboratory: Food and Nutrient Analysis**	4.0
NFS 371	**Institutional Organization and Administration**	3.0
NFS 373	**Food Service Planning and Equipment Selection**	3.0
NFS 390	**Community Nutrition**	3.0
NFS 415	**Advanced Nutrition I: Macronutrients**	4.0
NFS 416	**Advanced Nutrition II: Micronutrients**	4.0
NFS 431	**Nutrition Counseling**	4.0
NFS 443	**Therapeutic Nutrition I**	3.0
NFS 444	**Therapeutic Nutrition II**	3.0
NFS 475	**Advanced Seminar in the Dietetics Profession**	3.0
NFS 491	**Senior Project**	3.0

Biological sciences courses		**Credits**
BIO 115	**Bioscience II: Organismal Physiology**	5.5
BIO 117	**Bioscience III: Principles of Genetics**	5.5
NFS 205	**Human Anatomy and Physiology**	5.0
NFS 270	**Microbial Food Safety and Sanitation**	4.0
NFS 400	**Nutritional Chemistry**	4.0
NFS 404	**Nutritional Chemistry Laboratory**	1.0

Chemistry courses		**Credits**
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
CHEM 103	**General Chemistry III**	5.0

Mathematics/statistics/computing courses		**Credits**
MCS 101	**Introduction to Analysis I**	4.0
MCS 102	**Introduction to Analysis II**	4.0
STAT 211	**Quantitative Methods for Research**	4.0

Communications courses		**Credits**
COM 230	**Techniques of Speaking**	3.0
COM 310	**Technical Writing**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0

Humanities and social sciences		**Credits**
ANTH 101	**Cultural Diversity**	
or		
SOC 101	**Introduction to Sociology**	3.0
ECON 211	**Principles of Economics I (Micro)**	3.0
ECON 212	**Principles of Economics II (Macro)**	3.0
PSY 101	**General Psychology**	3.0
PSY 230	**Psychology of Learning**	

or		
PSY 320	**Educational Psychology**	3.0
PSY 342	**Counseling Psychology**	3.0
UNIV S101	**The Drexel Experience**	4.0

Business courses		**Credits**
ACCT 111	**Financial Accounting I**	3.0
HRMT 311	**Human Resource Management**	
or		
HRMT 323	**Principles of Human Resource Administration**	3.0
ORGB 300	**Organizational Behavior**	4.0

Other courses		**Credits**
	Free electives	17.0

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in Food Science

The minor in food science is designed for students interested in applying the basic sciences to the world's largest industry. The minor should be especially attractive to students in the premedical, chemical, and biological sciences, as it provides a background for excellent employment and post-baccalaureate study opportunities in areas closely allied to their basic disciplines.

The minor consists of 25 credits. Interested students should consult with a nutrition and foods faculty member to schedule courses appropriate for their background and goals.

Required courses		**Credits**
NFS 200	**Nutrition I: Principles of Nutrition**	4.0
NFS 203	**Nutrition II: Nutrition in the Life Cycle**	4.0
NFS 270	**Microbial Food Safety and Sanitation**	4.0
NFS 454	**Microbiology and Chemistry of Food Safety**	3.0
NFS 458	**Nutritional Impact of Food Processing Methods**	3.0
NFS 460	**Food Chemistry**	3.0
NFS 461	**Food Chemistry Laboratory**	4.0

Minor in Nutrition

The minor in nutrition is designed for students interested in enhancing their major with an application in human nutrition. The nutrition minor should be especially attractive to students in the premedical, biological, and behavioral neurological sciences, as it provides a background for enhanced employment and post-baccalaureate study opportunities in areas closely allied to their basic disciplines.

The minor consists of 25 credits. Interested students should consult with a nutrition and foods faculty member to schedule courses appropriate for their background and goals.

Required courses	Credits
NFS 200 **Nutrition I: Principles of Nutrition**	4.0
NFS 203 **Nutrition II: Nutrition in the Life Cycle**	4.0
NFS 415 **Advanced Nutrition I: Macronutrients and Energy**	4.0
NFS 416 **Advanced Nutrition II: Micronutrients and Control**	4.0

Three of the following courses	9.0
NFS 101 **Introduction to Nutrition and Foods**	
NFS 150 **Foods I: Components and Properties**	
NFS 152 **Foods II: Formulations and Interactions**	
NFS 345 **Foods and Nutrition of World Cultures**	
NFS 390 **Community Nutrition**	
NFS 431 **Nutrition Counseling**	
NFS 443 **Therapeutic Nutrition I**	
NFS 444 **Therapeutic Nutrition II**	

Physics

Bachelor of Science Degree: 185.0 credits

The physics degree provides a sound basis either for entering graduate school or for pursuing a variety of industrial careers. The Laboratory for High-Performance Computational Physics is now in place, and courses allow students to become proficient in numerical techniques, parallel processing, electronic communication, and the basic computer languages and software relevant to advanced studies and research in physics and atmospheric science. Virtually every course listed below has an associated computational component designed to extend the students' ability to handle real-world problems solved by state-of-the-art techniques. An important feature of the program is the large number of electives, which allow a student to pursue topics of special interest. There are elective sequences in biology for those preparing to enter biophysics or medicine and advanced topics for those interested in atomic, nuclear, solid-state, theoretical, or atmospheric physics. Students can also choose electives to meet teacher certification requirements.

Degree Requirements

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
UNIV S101	**The Drexel Experience**	4.0
	History of science elective	3.0
	Liberal studies electives*	9.0
	Business electives	6.0
	Free electives	6.0

***It is strongly recommended that a student's liberal studies and/or free electives include COM 230 (Techniques of Speaking) and COM 310 (Technical Communication).**

Mathematics/computer science requirements		Credits
CS 170	**Computer Programming**	3.0
CS 280	**Special Topics: Computer Programming**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
MATH 210	**Differential Equations**	4.0
MATH 545	**Advanced Engineering Mathematics II**	3.0

Chemistry requirements		Credits
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0

BIO 102	**Biology I: Cells and Tissues**	
or		
CHEM 103	**General Chemistry III**	4.0-5.0

Physics requirements		**Credits**
PHYS 105	**Computational Physics I**	3.0
PHYS 223	**Modern Physics Laboratory**	1.0
PHYS 226	**Instrumentation for Scientists I**	3.0
PHYS 227	**Instrumentation for Scientists II**	3.0
PHYS 305	**Computational Physics II**	3.0
PHYS 306	**Computational Physics Laboratory I**	2.0
PHYS 307	**Computational Physics Laboratory II**	2.0
PHYS 308	**Problem-Solving in Physics**	2.0
PHYS 311	**Classical Mechanics I**	4.0
PHYS 312	**Classical Mechanics II**	4.0
PHYS 316	**Thermodynamics**	3.0
PHYS 317	**Statistical Mechanics**	3.0
PHYS 321	**Electromagnetic Fields I**	4.0
PHYS 322	**Electromagnetic Fields II**	4.0
PHYS 323	**Topics in Mathematical Physics**	3.0
PHYS 326	**Quantum Mechanics I**	4.0
PHYS 327	**Quantum Mechanics II**	4.0
PHYS 328	**Advanced Laboratory**	3.0
PHYS 405	**Advanced Computational Physics**	3.0
PHYS 408	**Seminar (three terms)**	3.0
PHYS 428	**Quantum Mechanics III**	3.0
PHYS 451	**Quantum Structure of Materials**	3.0
PHYS 480-111	**Contemporary Physics I**	5.0
PHYS 480-112	**Contemporary Physics II**	5.0
PHYS 480-211	**Contemporary Physics III**	5.0
PHYS 491	**Senior Research I**	3.0
PHYS 492	**Senior Research II**	3.0
PHYS 493	**Senior Research III**	3.0
	Physics required courses**	9.0
	Technical elective	3.0

****The three physics required courses will be chosen from the following, scheduled at the discretion of the Physics Department: PHYS 314 (Nonlinear Dynamics), PHYS 361 (Principles of Laser Physics), PHYS 433 (Topics in Astrophysics), PHYS 476 (Nuclear and Particle Physics). Three of these courses will be offered during any given two-year period; none will be repeated within any two-year period.**

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in Physics

A minor in physics requires a total of 37.5 credits from among the following courses:

Required courses		**Credits**
PHYS 480-111	**Contemporary Physics I**	5.0
PHYS 480-112	**Contemporary Physics II**	5.0
PHYS 480-211	**Contemporary Physics III**	5.0
PHYS 311	**Classical Mechanics I**	4.0
PHYS 312	**Classical Mechanics II**	4.0
PHYS 321	**Electromagnetic Fields I**	4.0
PHYS 326	**Quantum Mechanics I**	4.0

Electives**		**4.0**
PHYS 305	**Computational Physics II**	
PHYS 314	**Nonlinear Dynamics**	
PHYS 322	**Electromagnetic Fields II**	
PHYS 327	**Quantum Mechanics II**	
PHYS 361	**Principles of Laser Physics**	
PHYS 433	**Topics in Astrophysics**	
PHYS 451	**Quantum Structure of Materials**	
PHYS 476	**Nuclear and Particle Physics**	

***PHYS 222 is preferred.**

****A minimum of 4.0 credits are required. Credit (1-4) will be given for courses taken in other departments that closely resemble these electives.**

Psychology/Sociology/Anthropology

Bachelor of Arts Degree: 182.0 credits

The psychology/sociology/anthropology program provides an interdisciplinary approach to the study of human behavior in a technologically changing world. The major, which draws on the three disciplines of the department, emphasizes substantive content, theory, and philosophy. The major is designed for students who are more humanistically oriented and who are interested in integrating an understanding of people and society in a technological context.

Degree Requirements

College/University requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
UNIV H101	**The Drexel Experience**	4.0
	Diversity studies	6.0
	Foreign language courses	8.0
	Humanities/fine arts electives	12.0
	International studies electives	6.0
	Math electives	6.0-8.0
	Science electives	6.0-8.0

Other courses		Credits
	Free electives	41.0

Departmental requirements		
ANTH 101	**Cultural Diversity**	
or		
ANTH 110	**The Human Past**	3.0
ANTH 410	**Cultural Theory**	3.0
PSY 101	**General Psychology**	3.0
PSY 140	**Approaches to Personality**	3.0
PSY 150	**Introduction to Social Psychology**	3.0
PSY 212	**Physiological Psychology**	3.0

PSY 230	**The Psychology of Learning**	
or		
PSY 330	**Cognitive Psychology**	3.0
PSY 360	**Experimental Psychology**	3.0
PSY 364	**Computer-Assisted Data Analysis I**	3.0
PSY 365	**Computer-Assisted Data Analysis II**	3.0
PSY 401	**History and Systems of Psychology**	3.0
PSY 480	**Directed Studies: Psychology Research Seminar I***	4.0
PSY 480	**Directed Studies: Psychology Research Seminar II***	4.0
PSY 480	**Directed Studies: Psychology Research Seminar III***	4.0
SOC 101	**Introduction to Sociology**	3.0
SOC 250	**Research Methods I**	3.0
SOC 260	**Classical Social Theory**	3.0
SOC 350	**Research Methods II**	3.0
	PSA electives	21.0
	Sociology electives**	6.0

***Students who do not wish to elect the research seminar sequence are required to take four additional PSA electives.**

****Sociology electives**		**Credits**
SOC 115	**Social Problems**	3.0
SOC 120	**Sociology of the Family**	3.0
SOC 205	**Criminology and Social Justice**	3.0
SOC 210	**Race and Ethnic Relations**	3.0
SOC 220	**Wealth and Power**	3.0
SOC 230	**Women and Men in a Changing Society**	3.0
SOC 320	**Sociology of Deviant Behavior**	3.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in Psychology

This minor meets the need of students who recognize that the understanding and analysis of individual psychological processes is an important component of their education and training, including those in business administration fields such as marketing or management and organizational sciences, information studies, design, and communications. Sufficient flexibility is built into the course groupings to allow students to select courses appropriate to their majors and their own personal interests. The minor in psychology will be attractive to those students who have expressed interest in a double major but cannot do so due to the need to satisfy all of the requirements in both fields.

This minor assumes that all students at the University will have taken an introductory course in psychology as part of their core curriculum requirements. No courses that are required for a student's major will count toward fulfilling the requirements for the minor. The department's advisor for academic minors will provide substitutes for any such overlap.

Required courses		Credits
PSY 140	**General Psychology II**	3.0
PSY 150	**Introduction to Social Psychology**	3.0
PSY 212	**Physiological Psychology**	3.0
PSY 360	**Experimental Psychology**	3.0

At least four of the following courses		12.0
PSY 120	**Developmental Psychology**	
PSY 210	**Comparative Psychology**	
PSY 213	**Sensation and Perception**	
PSY 222	**Psychological Problems of Modern Youth**	
PSY 230	**Psychology of Learning**	
PSY 240	**Abnormal Psychology**	
PSY 250	**Industrial Psychology**	
PSY 252	**Death and Dying**	
PSY 254	**Psychology of Sexual Behavior**	
PSY 310	**Drugs and Human Behavior**	
PSY 320	**Educational Psychology**	
PSY 330	**Cognitive Psychology**	
PSY 332	**Human Factors and Cognitive Engineering**	
PSY 337	**The Psychology of Human-Computer Interaction**	
PSY 340	**Psychological Testing and Assessment**	
PSY 342	**Counseling Psychology**	
PSY 350	**Advanced Social Psychology**	
PSY 364	**Computer-Assisted Data Analysis I**	
PSY 365	**Computer-Assisted Data Analysis II**	
PSY 401	**History and Systems of Psychology**	

PSY 410 **Neuropsychology**

PSY 480 **Directed Studies**

Psychology

Bachelor of Science Degree: 182.0 credits

This comprehensive major allows students to concentrate on their own areas of interest, providing practical and useful behavioral science training for graduate school or career. Majors select from courses spanning the traditional curriculum in clinical, personality, developmental, cognitive, and social psychology, and neuropsychology.

Degree Requirements

College/University requirements		Credits
CS 161	**Introduction to Computing**	3.0
ENGL 203	**Masterworks of Non-Western Literature I**	
or		
ENGL 204	**Masterworks of Non-Western Literature II**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Analysis I**	
or		
MATH 121	**Calculus I**	4.0
MATH 102	**Introduction to Analysis II**	
or		
MATH 122	**Calculus II**	4.0
PSCI 100	**Introduction to Political Science**	4.0
UNIV H101	**The Drexel Experience**	4.0
	Economics elective	4.0
	Fine arts elective	3.0
	History electives	6.0
	Philosophy elective	3.0

One of the following courses		**3.0**
ENGL 200	**Masterworks of Western Literature**	
ENGL 201	**Masterworks of Western Literature II**	
ENGL 203	**Masterworks of Western Literature III**	

One of the following course sequences		**8.0**
BIO 102	**Biology I: Cells and Tissues**	
BIO 104	**Biology II: Growth and Heredity**	
or		
CHEM 101	**General Chemistry I**	
CHEM 102	**General Chemistry IIII**	
or		
PHYS 103	**General Physics I**	

PHYS 104	**General Physics II**	

Other courses		**Credits**
	Free electives	52.0

Department requirements		**Credits**
ANTH 101	**Cultural Diversity: Introduction to Cultural Anthropology**	3.0
PSY 111, 112	**Preprofessional Psychology for Majors Sequence***	6.0
PSY 120	**Developmental Psychology**	3.0
PSY 150	**Introduction to Social Psychology**	3.0
PSY 212	**Physiological Psychology**	3.0
PSY 230	**Psychology of Learning**	3.0
PSY 240	**Abnormal Psychology**	3.0
PSY 330	**Cognitive Psychology**	3.0
PSY 360	**Experimental Psychology**	3.0
PSY 364	**Computer-Assisted Data Analysis I**	3.0
PSY 365	**Computer-Assisted Data Analysis II**	3.0
PSY 401	**History and Systems of Psychology**	3.0
PSY 480	**Directed Studies: Psychology Research Seminar I****	4.0
PSY 480	**Directed Studies: Psychology Research Seminar II****	4.0
PSY 480	**Directed Studies: Psychology Research Seminar III****	4.0
SOC 101	**Introduction to Sociology**	3.0
SOC 250	**Research Methods I**	3.0
SOC 350	**Research Methods II**	3.0

*** Students who do not wish to elect the research seminar sequence are required to take four additional psychology electives.*

At least four of the following courses	**12.0**
PSY 210	**Comparative Psychology**
PSY 213	**Sensation and Perception**
PSY 245	**Sports Psychology**
PSY 250	**Industrial Psychology**
PSY 252	**Death and Dying**
PSY 310	**Drugs and Human Behavior**
PSY 322	**Advanced Developmental Psychology**
PSY 332	**Human Factors and Cognitive Engineering**
PSY 337	**The Psychology of Human-Computer Interaction**
PSY 340	**Psychological Testing and Assessment**
PSY 343	**Counseling Psychology**
PSY 350	**Advanced Social Psychology**
PSY 410	**Neuropsychology**
PSY 440	**Advanced Personality Semina**
PSY 442	**Theories and Practice in Clinical Psychology**

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Sociology

Bachelor of Science Degree: 182.0 credits

This applied program of service learning uses the city as a laboratory. The curriculum provides students with the qualitative, quantitative, and theoretical skills to work in community settings. The same skills provide students with a competitive advantage in graduate school and the job market.

Degree Requirements

College/University requirements		Credits
CS 161	**Introduction to Computing**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
LIT 203	**Masterworks of Non-Western Literature I**	
or		
LIT 204	**Masterworks of Non-Western Literature II**	3.0
MATH 101	**Introduction to Analysis I**	
or		
MATH 121	**Calculus I**	4.0
MATH 102	**Introduction to Analysis II**	
or		
MATH 122	**Calculus II**	4.0
PSCI 100	**Introduction to Political Science**	4.0
UNIV H101	**The Drexel Experience**	4.0
	Economics elective	4.0
	Fine arts elective	3.0
	History electives	6.0
	Philosophy elective	3.0

One of the following courses		3.0
LIT 200	**Masterworks of Western Literature I**	
LIT 201	**Masterworks of Western Literature II**	
LIT 202	**Masterworks of Western Literature III**	

One of the following course sequences		8.0

BIO 102	**Biology I: Cells and Tissues**	
BIO 104	**Biology II: Growth and Heredity**	
or		
CHEM 101	**General Chemistry I**	
CHEM 102	**General Chemistry II**	
or		
PHYS 103	**General Physics I**	
PHYS 104	**General Physics II**	

Other courses	**Credits**
Free electives	**40.0-46.0**

Departmental requirements		**Credits**
ANTH 101	**Cultural Diversity: Introduction to Cultural Anthropology**	3.0
ANTH 210	**Worldview: Science, Religion, Magic**	3.0
ANTH 370	**Ethnographic Methods**	3.0
ANTH 410	**Cultural Theory**	3.0
PSY 101	**General Psychology**	3.0
PSY 364	**Computer-Assisted Data Analysis I**	3.0
PSY 365	**Computer-Assisted Data Analysis II**	3.0
SOC 101	**Introduction to Sociology**	3.0
SOC 250	**Research Methods I**	3.0
SOC 260	**Classical Social Theory**	3.0
SOC 270	**Theory of Applied and Community Sociology**	3.0
SOC 350	**Research Methods II**	3.0
SOC 370	**Practicum in Applied and Community Sociology**	3.0-9.0
SOC 470	**Social Change and Social Planning**	3.0
SOC 490	**Directed Studies: Sociology Research Seminar I***	4.0
SOC 491	**Sociology Research Seminar II***	4.0
SOC 492	**Sociology Research Seminar III***	4.0
	Substantive sociology electives**	24.0

***Students who do not wish to elect the research seminar sequence are required to take four additional sociology electives.**

****Substantive electives**		**Credits**
ANTH 110	**The Human Past**	3.0
ANTH 120	**Biblical Archaeology**	3.0
ANTH 220	**Aging in Cross-Cultural Perspective**	3.0
ANTH 310	**Societies in Transition**	3.0
SOC 110	**Sociology of the Future**	3.0
SOC 115	**Social Problems**	3.0
SOC 120	**Sociology of the Family**	3.0
SOC 125	**Sociology of the Aging**	3.0
SOC 205	**Criminology and Social Justice**	3.0
SOC 210	**Race and Ethnic Relations**	3.0
SOC 215	**Industrial Sociology**	3.0
SOC 220	**Wealth and Power**	3.0
SOC 225	**Sociology of Health**	3.0
SOC 230	**Women and Men in a Changing Society**	3.0
SOC 240	**Urban Sociology**	3.0
SOC 245	**Sociology of the Environment**	3.0
SOC 320	**Sociology of Deviant Behavior**	3.0
SOC 330	**Developing Nations**	3.0
SOC 335	**Sociology of Education I**	3.0
SOC 336	**Sociology of Education II**	3.0
SOC 460	**Contemporary Social Theory**	3.0

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in Sociology

The sociology minor is designed to give students specializing in other fields a broader knowledge of contemporary social issues and the ability to analyze them in a reasoned fashion. For students majoring in such fields as business and engineering, the minor helps develop skills in critical thinking that go beyond the acquisition of specialized, professional techniques. For students majoring in another area of the liberal arts, the minor offers the opportunity to place the issues raised in the major discipline within a larger social context.

Required courses		Credits
SOC 250	**Research Methods I**	3.0
SOC 260	**Classical Social Theory**	3.0
SOC 460	**Contemporary Social Theory**	3.0

Five of the following courses		15.0
ANTH 220	**Aging in Cross-Cultural Perspectives**	
ANTH 310	**Societies in Transition: The Impact of Modernization and the Third World**	
SOC 110	**Sociology of the Future**	
SOC 115	**Social Problems**	
SOC 120	**Sociology of the Family**	
SOC 125	**Sociology of the Aging**	
SOC 205	**Criminology and Criminal Justice**	
SOC 210	**Race and Ethnic Relations**	
SOC 215	**Industrial Sociology**	
SOC 220	**Wealth and Power**	
SOC 225	**Technology and Aging in Industrial Societies**	
SOC 230	**Women and Men in a Changing Society**	
SOC 235	**Medical Sociology**	
SOC 310	**Topics in Political Sociology**	
SOC 320	**Sociology of Deviant Behavior**	
SOC 330	**Developing Nations and the International Division of Labor**	
SOC 340	**Working with the Older Adult**	
SOC 350	**Research Methods II**	
SOC 470	**Social Change and Social Planning**	

Minor in Anthropology

The anthropology minor provides students in other fields with a cross-cultural awareness that will enable them to interact with a variety of people in a wide range

of situations. By giving students a respect for and understanding of the basis of cultural variation, the minor can facilitate working in international settings. Even for students working within the United States, anthropology offers increased sensitivity to ethnic and population diversity. Medicine, law, counseling, nursing, and nutrition are only a few of the fields in which clients and professionals may come from different parts of our heterogeneous society.

Required (core) courses		Credits
ANTH 101	**Cultural Diversity**	3.0
ANTH 110	**The Human Past: An Introduction to Physical Anthropology and Prehistoric Archaeology**	3.0
ANTH 210	**Worldview: Science, Religion, Magic**	3.0
ANTH 410	**Cultural Theory**	3.0

Four of the following courses		12.0
ANTH 120	**Biblical Archaeology**	
ANTH 212	**Topics in World Ethnography**	
ANTH 220	**Aging in Cross-Cultural Perspectives**	
ANTH 310	**Societies in Transition**	
ANTH 312	**Approaches to Intercultural Behavior**	
ANTH 370	**Ethnographic Methods**	
SOC 230	**Women and Men in a Changing Society**	
SOC 330	**Developing Nations**	

Unified Science

Bachelor of Science Degree: 185.5 credits

A growing number of careers require a strong foundation in science and mathematics, one that emphasizes a broad, balanced view rather than an intensive study of a single discipline. Patent attorneys, science writers and illustrators, textbook editors, and high school science and mathematics teachers are among those who require such a background.

The unified science major provides a strong grounding in science and mathematics. The foundation in chemistry, biology, physics, and mathematics, combined with electives, permits students adequate latitude to plan with an advisor a highly individualized program. Special requirements, such as courses for entrance to medical school or law school, should be identified as early as possible so they can be scheduled into the program.

A teacher certification program is also available within unified science.

Degree Requirements

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
MATH 210	**Differential Equations**	4.0
UNIV H101	**The Drexel Experience**	4.0
	Business electives	6.0
	Computer programming	3.0
	Liberal studies electives	12.0
	Free elective	40.0

Science requirements		Credits
BIO 114	**Bioscience I: Growth of Organisms and Populations**	5.5
BIO 115	**Bioscience II: Organismal Physiology**	5.5
BIO 117	**Bioscience III: Molecular Cell Biology**	5.5
BIO 254	**Invertebrate Morphology and Physiology**	5.0

BIO 256	**Vertebrate Morphology and Physiology**	5.0
BIO 303	**Biochemistry I**	3.5
BIO 305	**Biochemistry I Laboratory**	2.0
BIO 307	**Biochemistry II**	3.5
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
CHEM 241	**Organic Chemistry I**	4.0
CHEM 242	**Organic Chemistry II**	4.0
PHYS 111	**Physics I**	4.5
PHYS 112	**Physics II**	4.5
PHYS 211	**Physics III**	4.5
PHYS 212	**Physics IV**	4.0
PHYS 316	**Thermodynamics**	4.0
	Science sequence	8.5
	Science elective	8.0

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Interdisciplinary Minors

Minor in African-American Studies

The minor in African-American studies was created to provide the opportunity for undergraduate students throughout the University to gain an understanding of and background in the history and cultures of peoples of African descent in North and South America, the Caribbean, and Africa. This interdisciplinary minor includes courses in anthropology, history, literature, music, political science, and sociology, and provides an opportunity for directed study in areas of particular interest to the students. The African-American studies minor has intrinsic intellectual value and helps prepare individuals to become contributors to an increasingly pluralistic society. At the same time, this minor allows students who plan vocations in business, the sciences, engineering, government, and social services to present to prospective employers a unique academic background that includes specialized knowledge in the history and cultures of African peoples.

Students are required to take 24 credits of coursework as follows:

Required courses		Credits
AFAM 101	**Intellectual/Cultural Foundations of the African-American Experience**	3.0
AFAM 298	**Independent Study: Themes in African-American Studies**	up to 6.0

Six of the following courses		15.0-18.0
AFAM 201	**African-American Aesthetics**	
AFAM 295	**Special Topics**	
ANTH 212	**Topics in World Ethnography: Peoples and Cultures of Sub-Saharan Africa**	
ANTH 310	**Societies in Transition: The Impact of Modernization and the Third World**	
DANC 350	**Jazz Dance Technique**	
ENGL 245	**American Ethnic Literature**	
ENGL 295	**Special Studies in Literature**	
ENGL 325	**Selected Topics in World Literature: Modern African Literature**	
HIST 210	**African-American History in the 19th Century**	
HIST 211	**African-American History in the 20th Century**	
HIST 212	**Themes in Afro-American History**	
HIST 213	**History of Slavery in British Colonial America**	

HIST 214	**Civil Rights Movement in the U.S.**
HIST 279	**Selected Studies in African, Asian, and Latin American History**
MUSC 107	**Jazz Ensemble and Combo**
MUSC 333	**African-American Music in the U.S.**
MUSC 336	**History of Jazz**
PSCI 365	**Politics, Law, and Justice**
PSCI 573	**Gender, Race, and Science***
SOC 210	**Race and Ethnicity**

***By permission only.**

Minor in Environmental Issues

The cross-cultural, interdisciplinary minor in environmental issues responds to the growing importance of environmental issues both in this country and in other major areas of the world. It offers in-depth study of issues about which future professionals will need to be well informed in order to operate effectively in the fields of diplomacy, government, politics, developmental policy, international business, and international trade.

The environmental issues minor requires a minimum of 24 credits, including a directed independent study and a minor thesis on environmental issues and public policy. There is also a prerequisite of 6 to 8 credits in environmental biology, ecology, and/or atmospheric science. The minor is administered through the Office of the Dean of the College of Arts and Sciences and is open to students in all disciplines.

Minor in Human Factors and Ergonomics

This minor is intended to meet the needs of students who have an interest in any type of design and who recognize the importance of taking account of human characteristics, both strengths and weaknesses, in the design of artifacts intended for human use (e.g., equipment, computer software, consumer products, and even entire work environments). The minor in human factors should also be of particular interest to students who have an interest in doing graduate work in human factors, ergonomics, industrial design, etc.

Any student wishing to minor in human factors must take PSY 101 as a prerequisite for entry into the minor. According to University policy, a limited number of courses required by a student's major can count toward fulfilling the course requirements for the minor (e.g., students in interior design may count INTR 150 toward the minor, and students in information science and technology may count PSY 330). Students who are interested in minoring in human factors and ergonomics are expected to meet with the faculty who teach PSY 332 to gain approval for any course substitutions to the requirements below (e.g., students who satisfy the University's requirements for enrolling in a graduate-level course may be allowed to take an approved graduate offering that can be substituted for a comparable undergraduate course).

Required courses	**Credits**

PSY 212	**Physiological Psychology**	3.0
PSY 213	**Sensation and Perception**	3.0
PSY 250	**Industrial Psychology**	3.0
PSY 330	**Cognitive Psychology**	3.0
PSY 332	**Human Factors & Cognitive Engineering**	3.0
PSY 337	**Psychology of Human-Computer Interaction**	3.0
PSY 360	**Experimental Psychology**	3.0
	One additional course selected from the list below	3.0

Additional courses

BMES 330	**Biological Rhythms in Pharmacology and Toxicology**
BMES 350	**The Medical and Biological Effects of Light**
BMES 411	**Chronoengineering I: Biological Rhythms in Health and Performance**
BMES 412	**Chronoengineering II: Sleep Functions in Health and Performance**
INTR 150	**Issues of the Interior Environment**
INTR 465	**Directed Studies: Introduction to Industrial Design**
INTR 465	**Directed Studies: Anthropometrics and Ergonomics**
PSY 150	**Social Psychology**
PSY 230	**Psychology of Learning**
PSY 310	**Drugs and Behavior**
PSY 340	**Psychological Testing and Assessment**
PSY 350	**Advanced Social Psychology**
PSY 480	**Directed Studies in Psychology**

The Louis Stein Minor in Judaic Studies

The Louis Stein Minor in Judaic Studies, housed within the College of Arts and Sciences, is designed to give students the opportunity to explore and understand the history, culture, politics, and religion of the Jewish people. Through interdisciplinary coursework and directed field study, students investigate the Jewish experience from both a contemporary and a historical perspective.

The minor requires 24 credits: 9 from required courses and 15 from electives. Students can apply a maximum of 6 credits toward the minor from field study under the supervision of the academic advisor. Currently, the required courses are as follows:

Required courses		Credits
ENGL 395	**Foundations of Jewish Civilization**	3.0
HIST 249	**Modern Jewish History**	3.0
HIST 298	**Development of the Jewish Community**	3.0

Courses offered as electives have included Contemporary Jewish Life; Introduction to Yiddish Culture; Israel: Language and Society; The Holocaust; A Thousand Years of Jewish Life Through Yiddish Literature; Jewish Ethical Literature; the American Jewish Experience; Language and Cultural Diversity in the USA, Jewish Spirituality and the Psychology of Happiness; and Jewish Women in Literature and History.

For more information, please contact Kathy Carll, program coordinator, at 215-895-6388; e-mail:kathy.carll@drexel.edu; or Dr. Rakhmiel Peltz, director of Judaic studies, at 215-895-1499; e-mail: rakhmiel.peltz @ drexel.edu.

Minor in Women's Studies

The minor in women's studies is intended to give students a broad, interdisciplinary understanding of the ways in which gender interacts with race, age, class, and sexual orientation to shape human consciousness and the social, political, and cultural organization of society. In addition, the minor is intended to enrich the educational experience of students. It may also provide both men and women with tools for understanding and coping with the larger societal systems in which they must operate as both students and professionals. Because business and industry are increasingly sensitive to issues such as sex discrimination, sexual harassment, equal pay for comparable work, parental leave, and day care, students with a minor in women's studies will have a definite edge over other applicants for managerial and policy-making positions.

Students are required to take 24 credits of coursework as follows:

Required courses		Credits
WMST 101	**Introduction to Women's Studies**	3.0
WMST 301	**Seminar in Feminist Theory**	3.0
	Electives*	18.0

***Chosen from an approved list including departmentally cross-linked courses and WMST 201 (Special Topics) courses.**

Electives include		Credits
ENGL 255	**Women and Literature**	3.0
HIST 223	**Women and Work in America**	3.0
HIST 224	**Women in American History**	3.0
HIST 286	**Explorations in Tech and Gender: A World Without Women**	3.0
HIST 586	**Gender and Technology***	3.0
PSCI 573	**Gender, Race, and Science***	3.0
PSY 480	**Women and Health Psychology**	3.0

SOC 230	**Women and Men in a Changing Society**	3.0
WMST 201	**Special Topics in Women's Studies**	3.0
WMST 299	**Independent Study**	up to 6.0

***By permission only.**

The School of Education

The School of Education is the umbrella for:

- Teacher education and its undergraduate and graduate programs, which lead to B.S. and M.S. degrees and Pennsylvania State Teacher Certification for kindergarten through grade 12.
- The Drexel/Torrance Center for Creative Studies and Creative Prevention of School Violence, which is committed to reducing violence in schools by assisting schools in designing, implementing, and evaluating a creative school violence prevention model of pedagogy based on current research in creativity as opposed to the prevalent punitive focus on discipline.

Title II Reporting
In compliance with Title II, Section 207, of the Higher Education Act of 1998 and General Standards for the Institutional Preparation of Professional Educators (Chapter 354), pass rates on the Praxis Series Exam for students prepared as teachers by Drexel University are available at the School of Education.

Teacher Education
Bachelor of Science Degree: credits required are found under each area of certification

Certification for classroom instruction is available in:

- Elementary education (emphasis on mathematics, science, and technology)
- Secondary education (grades 7-12)
  - Biology
  - Chemistry
  - Earth and Space Science
  - General Science
  - Mathematics
  - Physics
- Secondary education (grades K-12)
  - Environmental Educaton

Students may acquire certification in more than one subject area.

Teacher education uses University-wide resources to prepare fully qualified mathematics and science teachers at both the elementary and secondary levels. It applies the microcomputer in teaching and learning, and it is the only such program in the country to incorporate a six-month paid internship in industry related to the student's area of certification (for example, a prospective chemistry teacher might co-op at a chemical company).

Because the program requires that students have a B average in content courses needed for certification, the student's content coursework is evaluated at the end of the sophomore year. All students are expected to meet the B average

requirement in content coursework before beginning pre-student field teaching experience. Students who fail to meet this requirement must take additional content coursework until the B average is met.

Students participate in two periods of direct teaching experience. The first period, in the junior year, consists of a ten-week field experience (EDUC 320) through which students participate in limited teaching; on-campus coursework accompanies the field experience (EDUC 325 and EDUC 326). In the senior year, students complete the 12-week student-teaching experience (EDUC 412) required for certification. Students must receive a grade of at least B in student teaching and in all pedagogy coursework to be recommended for certification.

Students pursuing the appropriate majors in the College of Arts and Sciences may also complete the requirements for certification within their area of study. For more information, contact the Director of the School of Education at 215-895-6770.

Combination certifications are also available. Sample combinations include:

- Biology certification, with courses for additional certification in chemistry.
- Chemistry certification, with courses for additional certification in biology.
- Earth and space science certification, with courses for additional certification in chemistry.
- Earth and space science certification, with courses for additional certification in physics.
- Mathematics certification, with courses for additional certification in physics
- .Physics certification, with courses for additional certification in mathematics.

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Elementary Education Certification

182.0 Credits

Degree Requirements

General education requirements		Credits
ECON 201	**Economics I**	4.0
ENGL	**Literature course between 200-329**	3.0
HIST 280	**History of Science I**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Analysis I**	4.0
MATH 102	**Introduction to Analysis II**	4.0
PSY 101	**General Psychology**	3.0
PSY 330	**Cognitive Psychology**	3.0
UNIV T101	**The Drexel Experience**	4.0
	Art or music elective	3.0
	Science, technology, and human affairs electives	6.0
	Professional or free electives	36.0

One of the following courses		3.0
HIST 201	**U.S. History to 1815**	
HIST 202	**U.S. History 1815 -1900**	
HIST 203	**The United States Since 1900**	

Science requirements		Credits
BIO 102	**Bioscience I: Cells and Tissue**	4.0
BIO 104	**Bioscience II: Growth and Heredity**	4.0
CHEM 111	**General Chemistry I**	
or		
PHYS 103	**General Physics I**	4.0

CHEM 112	**General Chemistry II**	
or		
PHYS 104	**General Physics II**	4.0
ENVR 260	**Environmental Issues**	3.0
PHYS 131	**Survey of the Universe**	3.0
NFS 101	**Introduction to Nutrition and Foods**	3.0

Education requirements		**Credits**
EDUC 105	**Freshman Seminar**	3.0
EDUC 112	**Integrative Instruction**	3.0
EDUC 114	**Science Teaching Methods**	3.0
EDUC 205	**Sophomore Seminar**	3.0
EDUC 216	**Diversity and Today's Teacher**	3.0
EDUC 218	**Math—Methods and Content**	3.0
EDUC 301	**Introduction to Personalized System of Instruction**	3.0
EDUC 305	**Junior Seminar**	2.0
EDUC 310	**Computer Applications in Teaching**	3.0
EDUC 320	**Professional Studies in Instruction**	9.0
EDUC 322	**Evaluation of Instruction**	4.0
EDUC 323	**Diagnostic Teaching**	4.0
EDUC 324	**Current Research in Curriculum and Instruction**	3.0
EDUC 325	**Multimedia in Instructional Design**	3.0
EDUC 326	**Language Arts Processes**	3.0
EDUC 327	**Learning Disabilities**	3.0
EDUC 405	**Senior Seminar**	2.0

Student teaching experience

EDUC 412	**Student Teaching**	12.0

Note: Education courses are identical for all certification areas, with the exception of professional or free electives.

Suggested Professional Electives

Bioscience		Credits
BIO 201	**Human Physiology I**	4.0
BIO 203	**Human Physiology II**	4.0
BIO 221	**Microbiology**	5.0
BIO 244	**Genetics I**	3.0
BIO 254	**Invertebrate Morphology and Physiology**	5.0
BIO 256	**Vertebrate Morphology and Physiology**	5.0
BIO 260	**Morphology and Physiology of Lower Animals**	4.5
BIO 262	**Morphology and Physiology of Higher Animals**	4.5
BIO 335	**Terrestrial Ecology**	5.0

Chemistry		Credits
CHEM 103	**General Chemistry III**	5.0
CHEM 230	**Quantitative Analysis**	3.0
CHEM 231	**Quantitative Analysis Laboratory**	2.0
CHEM 241	**Organic Chemistry I**	4.0
CHEM 242	**Organic Chemistry II**	4.0

Nutrition and foods		Credits
NFS 200	**Nutrition I: Principles of Nutrition**	4.0

Physics		Credits
PHEV 141	**Atmospheric Science I: Climate and Global Change**	3.0
PHEV 143	**Atmospheric Science II: Weather and Forecasting**	3.0
PHYS 106	**The Physics of High Fidelity**	3.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Biology Certification

182.5 credits

Certification is for grades 7 - 12

Degree Requirements

General education requirements		Credits
HIST 280	**History of Science I**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
PSY 101	**General Psychology**	4.0
PSY 330	**Cognitive Psychology**	3.0
UNIV T101	**The Drexel Experience**	4.0
	Electives	6.0

Science requirements		Credits
BIO 114	**Bioscience I: Growth of Organisms and Populations**	5.5
BIO 115	**Bioscience II: Organismal Physiology**	5.5
BIO 116	**Bioscience III: Molecular Cell Biology**	5.5
BIO 204	**Bioscience IV**	5.5
BIO 206	**Bioscience V**	5.5
BIO 268	**Vertebrate Developmental Biology**	4.5
BIO 303	**Biochemistry I**	3.5
BIO 305	**Biochemistry I Laboratory**	2.0
BIO 460	**Evolution**	5.5
CHEM 101	**General Chemistry**	4.0

CHEM 102	**General Chemistry II**	4.0
CHEM 241	**Organic Chemistry**	4.0
CHEM 242	**Organic Chemistry II**	4.0
CHEM 244	**Organic Chemistry I Laboratory**	3.0
ENVR 284	**Ecology I: Physiological and Population Ecology**	5.0
PHYS 480	**Physics for Bioscience I**	4.5
PHYS 480	**Physics for Bioscience II**	4.5

Education requirements		**Credits**
EDUC 105	**Freshman Seminar**	3.0
EDUC 112	**Integrative Introduction**	3.0
EDUC 114	**Science Teaching Methods**	3.0
EDUC 205	**Sophomore Seminar**	3.0
EDUC 216	**Diversity and Today's Teacher**	3.0
EDUC 218	**Math: Methods and Content**	3.0
EDUC 301	**Introduction to Personalized System of Instruction**	3.0
EDUC 305	**Junior Seminar**	2.0
EDUC 310	**Computer Applications in Teaching**	3.0
EDUC 320	**Professional Studies in Instruction**	9.0
EDUC 322	**Evaluation of Instruction**	4.0
EDUC 323	**Diagnostic Teaching**	4.0
EDUC 324	**Current Research in Curriculum and Instruction**	3.0
EDUC 325	**Multimedia in Instructional Design**	3.0
EDUC 326	**Language Arts Processes**	3.0
EDUC 327	**Learning Disabilities**	3.0
EDUC 405	**Senior Seminar**	2.0

Student teaching experience

EDUC 412	**Student Teaching**	12.0

Chemistry Certification

190.5 credits

Certification is for grades 7 - 12

Degree Requirements

General education requirements		Credits
HIST 280	**History of Science I**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
PHIL 251	**Ethics**	3.0

Science requirements		Credits
BIO 102	**Bioscience I**	4.0
BIO 104	**Bioscience II**	4.0
BIO 301	**Biochemistry I**	5.0
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
CHEM 103	**General Chemistry III**	5.0
CHEM 230	**Quantitative Analysis**	4.0
CHEM 231	**Quantitative Analysis Laboratory**	2.0
CHEM 241	**Organic Chemistry**	4.0
CHEM 242	**Organic Chemistry II**	4.0
CHEM 243	**Organic Chemistry III**	3.0

CHEM 244	**Organic Chemistry I Laboratory**	3.0
CHEM 251	**Physical Chemistry I**	4.0
CHEC 352	**Physical Chemistry and Applications II**	4.0
CHEM 251	**Physical Chemistry I Laboratory**	2.5
CHEM 421	**Inorganic Chemistry I**	3.0
CHEM 430	**Analytical Chemistry I**	4.0
CHEM 110	**Environmental Chemistry**	2.0
PHYS 111	**Physics I**	4.5
PHYS 112	**Physics II**	4.5
PHYS 131	**Survey of the Universe**	
or		
PHEV 141	**Atmospheric Science I: Climate and Global Change**	3.0
CHEM 245	**Organic Chemistry II Laboratory**	3.0
CHEM 252	**Physical Chemistry II**	3.0

Education requirements		**Credits**
EDUC 105	**Freshman Seminar**	3.0
EDUC 112	**Integrative Introduction**	3.0
EDUC 114	**Science Teaching Methods**	3.0
EDUC 205	**Sophomore Seminar**	3.0
EDUC 216	**Diversity and Today's Teacher**	3.0
EDUC 218	**Math: Methods and Content**	3.0
EDUC 301	**Introduction to Personalized System of Instruction**	3.0
EDUC 305	**Junior Seminar**	2.0
EDUC 310	**Computer Applications in Teaching**	3.0
EDUC 320	**Professional Studies in Instruction**	9.0
EDUC 322	**Evaluation of Instruction**	4.0
EDUC 323	**Diagnostic Teaching**	4.0
EDUC 324	**Current Research in Curriculum and Instruction**	3.0
EDUC 325	**Multimedia in Instructional Design**	3.0

EDUC 326	**Language Arts Processes**	3.0
EDUC 327	**Learning Disabilities**	3.0
EDUC 405	**Senior Seminar**	2.0

Student teaching experience

EDUC 412	**Student Teaching**	12.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Earth and Space Science Certification

186.0 credits

Certification is for grades 7 - 12

Degree Requirements

General education requirements		Credits
ECON 211	**Principles of Economics I (Micro)**	4.0
ECON 212	**Principles of Economics II (Macro)**	4.0
HIST 280	**History of Science I**	3.0
HIST 285	**Technology in Historical Perspective**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
PHIL 251	**Ethics**	3.0
PSY 101	**General Psychology**	3.0
UNIV T101	**The Drexel Experience**	4.0

Science requirements		Credits
BIO 102	**Bioscience I**	4.0
BIO 104	**Bioscience II**	4.0
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
EGEO 200	**Physical Geology**	3.0
EGEO 230	**Historical Geology**	3.0
ENVR 169	**Environmental Science**	3.0
ENVR 260	**Environmental Issues**	3.0
ENVR 284	**Ecology I: Physiological and Population Ecology**	5.0
ENVR 286	**Ecology II: Communities and Ecosystems**	5.0
ENVR 300	**Environmental Impacts**	3.0

ENVR 330	**Aquatic Ecology**	3.0
ENVR 390	**Marine Ecology**	3.0
PHEV 141	**Atmospheric Science I: Climate and Global Change**	3.0
PHEV 142	**Atmospheric Science I Laboratory**	1.0
PHEV 143	**Atmospheric Science II**	3.0
PHEV 144	**Atmospheric Science II Laboratory**	1.0
PHEV 441	**Issues in Global Change I: Seminar**	2.0
PHEV 442	**Issues in Global Change II: Research**	2.0
PHYS 111	**Physics I**	4.5
PHYS 112	**Physics II**	4.5
PHYS 131	**Survey of the Universe**	3.0
PHYS 211	**Physics III**	4.5
PHYS 226	**Instrumentation for Scientists I**	3.0
PHYS 227	**Instrumentation for Scientists II**	3.0

Education requirements

EDUC 105	**Freshman Seminar**	3.0
EDUC 112	**Integrative Instruction**	3.0
EDUC 114	**Science Teaching Methods**	3.0
EDUC 205	**Sophomore Seminar**	3.0
EDUC 216	**Diversity and Today's Teacher**	3.0
EDUC 218	**Math — Methods and Content**	3.0
EDUC 301	**Introduction to Personalized System of Instruction**	3.0
EDUC 305	**Junior Seminar**	2.0
EDUC 310	**Computer Applications in Teaching**	3.0
EDUC 320	**Professional Studies in Instruction**	9.0
EDUC 322	**Evaluation of Instruction**	4.0
EDUC 323	**Diagnostic Teaching**	4.0
EDUC 324	**Current Research in Curriculum and Instruction**	3.0
EDUC 325	**Multimedia in Instructional Design**	3.0
EDUC 326	**Language Arts Processes**	3.0
EDUC 327	**Learning Disabilities**	3.0
EDUC 405	**Senior Seminar**	2.0

Student teaching experience

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

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Environmental Certification

186.0 credits

Certification is for grades K - 12

Degree Requirements

General education requirements		Credits
ECON 211	**Principles of Economics I (Micro)**	4.0
ECON 212	**Principles of Economics II (Macro)**	4.0
HIST 280	**History of Science I**	3.0
HIST 285	**Technology in Historical Perspective**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
PHIL 251	**Ethics**	3.0
PSY 101	**General Psychology**	3.0
UNIV T101	**The Drexel Experience**	4.0

Science requirements		Credits
BIO 102	**Bioscience I**	4.0
BIO 104	**Bioscience II**	4.0
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
EGEO 200	**Physical Geology**	3.0
EGEO 230	**Historical Geology**	3.0
ENVR 169	**Environmental Science**	3.0
ENVR 260	**Environmental Issues**	3.0
ENVR 284	**Ecology I: Physiological and Population Ecology**	5.0
ENVR 286	**Ecology II: Communities and Ecosystems**	5.0
ENVR 300	**Environmental Impacts**	3.0

ENVR 330	**Aquatic Ecology**	3.0
ENVR 390	**Marine Ecology**	3.0
PHEV 141	**Atmospheric Science I: Climate and Global Change**	3.0
PHEV 142	**Atmospheric Science I Laboratory**	1.0
PHEV 143	**Atmospheric Science II**	3.0
PHEV 144	**Atmospheric Science II Laboratory**	1.0
PHEV 441	**Issues in Global Change I: Seminar**	2.0
PHEV 442	**Issues in Global Change II: Research**	2.0
PHYS 111	**Physics I**	4.5
PHYS 112	**Physics II**	4.5
PHYS 131	**Survey of the Universe**	3.0
PHYS 211	**Physics III**	4.5
PHYS 226	**Instrumentation for Scientists I**	3.0
PHYS 227	**Instrumentation for Scientists II**	3.0

Education requirements

EDUC 105	**Freshman Seminar**	3.0
EDUC 112	**Integrative Instruction**	3.0
EDUC 114	**Science Teaching Methods**	3.0
EDUC 205	**Sophomore Seminar**	3.0
EDUC 216	**Diversity and Today's Teacher**	3.0
EDUC 218	**Math — Methods and Content**	3.0
EDUC 301	**Introduction to Personalized System of Instruction**	3.0
EDUC 305	**Junior Seminar**	2.0
EDUC 310	**Computer Applications in Teaching**	3.0
EDUC 320	**Professional Studies in Instruction**	9.0
EDUC 322	**Evaluation of Instruction**	4.0
EDUC 323	**Diagnostic Teaching**	4.0
EDUC 324	**Current Research in Curriculum and Instruction**	3.0
EDUC 325	**Multimedia in Instructional Design**	3.0
EDUC 326	**Language Arts Processes**	3.0
EDUC 327	**Learning Disabilities**	3.0
EDUC 405	**Senior Seminar**	2.0

Student teaching experience

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

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General Science Certification

184.0 credits

Certification is for grades 7 - 12

Degree Requirements

General education requirements		Credits
HIST 280	**History of Science I**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
PSY 101	**General Psychology**	3.0
PSY 330	**Cognitive Psychology**	3.0
UNIV T101	**The Drexel Experience**	4.0
	Electives	15.0

Science requirements		Credits
BIO 102	**Bioscience I**	4.0
BIO 104	**Bioscience II**	4.0
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
CHEM 103	**General Chemistry III**	3.0
EGEO 200	**Physical Geology**	3.0
EGEO 230	**Historical Geology**	3.0
ENVR 260	**Environmental Issues**	4.0
ENVR 284	**Ecology I: Physiological and Population Ecology**	3.0
ENVR 286	**Ecology II**	3.0
ENVR 390	**Marine Ecology**	3.0
PHEV 141	**Atmospheric Science I: Climate and Global Change**	3.0
PHYS 111	**Physics I**	4.5
PHYS 112	**Physics II**	4.5
PHYS 131	**Survey of the Universe**	3.0

PHYS 226	**Instrumentation for Scientists I**	4.0
PHYS 227	**Instrumentation for Scientists II**	3.0

Education requirements

EDUC 105	**Freshman Seminar**	3.0
EDUC 112	**Integrative Instruction**	3.0
EDUC 114	**Science Teaching Methods**	3.0
EDUC 205	**Sophomore Seminar**	3.0
EDUC 216	**Diversity and Today's Teacher**	3.0
EDUC 218	**Math—Methods and Content**	3.0
EDUC 301	**Introduction to Personalized System of Instruction**	3.0
EDUC 305	**Junior Seminar**	2.0
EDUC 310	**Computer Applications in Teaching**	3.0
EDUC 320	**Professional Studies in Instruction**	9.0
EDUC 322	**Evaluation of Instruction**	4.0
EDUC 323	**Diagnostic Teaching**	4.0
EDUC 324	**Current Research in Curriculum and Instruction**	3.0
EDUC 325	**Multimedia in Instructional Design**	3.0
EDUC 326	**Language Arts Processes**	3.0
EDUC 327	**Learning Disabilities**	3.0
EDUC 405	**Senior Seminar**	2.0

Student teaching experience

EDUC 412	**Student Teaching**	12.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Mathmatics Certification

183.0 credits

Certification is for grades 7 - 12

Degree Requirements

General education requirements		Credits
CS 164	**Introduction to Computer Science**	3.0
CS 171	**Computer Programming**	3.0
ECON 211	**Principles of Economics I (Micro)**	4.0
HIST 280	**History of Science I**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
PHIL 251	**Ethics**	3.0
PSY 101	**General Psychology I**	3.0
PSY 330	**Cognitive Psychology**	3.0
UNIV T101	**The Drexel Experience**	4.0
	Literature elective	3.0
	Electives	12.0

Mathematics requirements		Credits
EDUC 428	**Cultural and Historical Significance of Math**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
MATH 210	**Differential Equations**	4.0
MATH 220	**Techniques of Mathematical Proof**	3.0
MATH 221	**Discrete Mathematics**	3.0
MATH 311	**Probability and Statistics I**	4.0

Science requirements		Credits
BIO 102	**Bioscience I**	4.0

BIO 104	**Bioscience II**	4.0
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
ENVR 260	**Environmental Issues**	3.0
PHYS 106	**The Physics of High Fidelity**	3.0
PHYS 111	**Physics I**	4.5
PHYS 112	**Physics II**	4.5

Education requirements

EDUC 105	**Freshman Seminar**	3.0
EDUC 112	**Integrative Instruction**	3.0
EDUC 114	**Science Teaching Methods**	3.0
EDUC 205	**Sophomore Seminar**	3.0
EDUC 216	**Diversity and Today's Teacher**	3.0
EDUC 218	**Math—Methods and Content**	3.0
EDUC 301	**Introduction to Personalized System of Instruction**	3.0
EDUC 305	**Junior Seminar**	2.0
EDUC 310	**Computer Applications in Teaching**	3.0
EDUC 320	**Professional Studies in Instruction**	9.0
EDUC 322	**Evaluation of Instruction**	4.0
EDUC 323	**Diagnostic Teaching**	4.0
EDUC 324	**Current Research in Curriculum and Instruction**	3.0
EDUC 325	**Multimedia in Instructional Design**	3.0
EDUC 326	**Language Arts Processes**	3.0
EDUC 327	**Learning Disabilities**	3.0
EDUC 405	**Senior Seminar**	2.0

Student teaching experience

EDUC 412	**Student Teaching**	12.0

Physics Certification

186.5 credits

Certification is for grades 7 - 12

Degree Requirements

General education requirements		Credits
HIST 280	**History of Science I**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
MATH 210	**Differential Equations**	4.0
PHIL 251	**Ethics**	3.0
PSY 101	**General Psychology**	3.0
PSY 330	**Cognitive Psychology**	3.0
UNIV T101	**The Drexel Experience**	4.0

Science requirements

BIO 102	**Bioscience I**	4.0
BIO 104	**Bioscience II**	4.0
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
ENVR 260	**Environmental Issues**	3.0
PHEV 141	**Atmospheric Science I: Climate and Global Change**	3.0
PHYS 111	**Physics I**	4.5
PHYS 112	**Physics II**	4.5
PHYS 131	**Survey of the Universe**	3.0
PHYS 211	**Physics III**	4.5
PHYS 222	**Modern Physics**	4.0
PHYS 223	**Modern Physics Laboratory**	1.0
PHYS 226	**Instrumentation for Scientists I**	4.0
PHYS 227	**Instrumentation for Scientists II**	3.0

PHYS 311	**Classical Mechanics I**	4.0
PHYS 316	**Thermodynamics**	4.0
PHYS 321	**Electromagnetic Fields I**	4.0
PHYS 326	**Quantum Mechanics I**	4.0

Education requirements

EDUC 105	**Freshman Seminar**	3.0
EDUC 112	**Integrative Instruction**	3.0
EDUC 114	**Science Teaching Methods**	3.0
EDUC 205	**Sophomore Seminar**	3.0
EDUC 216	**Diversity and Today's Teacher**	3.0
EDUC 218	**Math—Methods and Content**	3.0
EDUC 301	**Introduction to Personalized System of Instruction**	3.0
EDUC 305	**Junior Seminar**	2.0
EDUC 310	**Computer Applications in Teaching**	3.0
EDUC 320	**Professional Studies in Instruction**	9.0
EDUC 322	**Evaluation of Instruction**	4.0
EDUC 323	**Diagnostic Teaching**	4.0
EDUC 324	**Current Research in Curriculum and Instruction**	3.0
EDUC 325	**Multimedia in Instructional Design**	3.0
EDUC 326	**Language Arts Processes**	3.0
EDUC 327	**Learning Disabilities**	3.0
EDUC 405	**Senior Seminar**	2.0

Student teaching experience

EDUC 412	**Student Teaching**	12.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

The Bennett S. LeBow College of Business

The mission of the Bennett S. LeBow College of Business is to educate students for successful business and professional careers. At the undergraduate and master's levels, this objective is accomplished by providing high-quality educational programs that integrate theory and practice through a combination of academic coursework and complementary professional work experience. Our highly regarded co-operative education program, in which students interchange periods of academic study and full-time, off-campus employment with partner companies, sets us apart from other business schools. At the Ph.D. level, our programs provide both a rigorous understanding of the disciplines of business and the research skills that enable exploration and discovery of new knowledge within those disciplines.

The vitality of all our academic programs is maintained by the scholarship of the College's distinguished faculty. The College is committed to advancing the science and practice of management through basic, applied, and instructional research in the various disciplines of business.

The College and its faculty maintain strong connections to business professions and the community through participation in professional organizations, a commitment to community service, and dedication to providing opportunities for lifelong learning.

Undergraduate Programs
The College offers three four-year and five-year co-op programs:

- Bachelor of Science in Business Administration
- Bachelor of Science in Commerce and Engineering
- Bachelor of Science in Economics

The College also offers two four-year non–co-op programs:

- Bachelor of Science in Business Administration
- Bachelor of Science in Economics

Goals of the Bachelor of Science in Business Administration Program
The Bachelor of Science in Business Administration program is designed to prepare students for managerial positions in business and other institutions. To accomplish this, the undergraduate curriculum has the following characteristics and goals:

- *An early exposure to the structure and functions of business enterprises*
- *The bridging of theory and concepts with professional practice*
- *The integration of material across disciplines within business as well as between business and other fields*
- *The enhancement of effective communication, problem-solving, and interpersonal skills*
- *Coverage of the ethical issues inherent in a business setting*
- *Coverage of the global, political, social, and legal/regulatory environment in which businesses operate*
- *Coverage of the impact of technology and technological changes on the operation of the business enterprise*

- *An emphasis on career preparation*
- *Opportunities for experiential learning through traditional co-op programs and other "hands-on" opportunities*

Goals of the Bachelor of Science in Commerce and Engineering Program
The Bachelor of Science in Commerce and Engineering program has the same characteristics and goals as the Bachelor of Science in Business Administration, with the additional goal of providing students with foundation-level knowledge in engineering and science. The Commerce and Engineering program prepares students for managerial and administrative positions in any business organization, especially where competence in engineering science and technology is critical.

Goals of the Bachelor of Science in Economics Program
The Bachelor of Science in Economics program is designed to provide students with an understanding of the market system, as well as economic institutions, policies and development. In addition to this deep coverage of economics, the major includes liberal arts and sciences requirements. The program is flexible, allowing the student to customize the curriculum and choose areas of emphasis ranging from political economy to mathematical economics, as well as to select a coordinating field from other majors and minors at Drexel.

Co-operative Education
The five-year co-operative education programs consist of 12 terms in college and six terms in co-operative employment. During the freshman year, students spend three terms in school (fall, winter, and spring) and have a summer vacation. For each of the next three years, students alternate two terms in school with two terms of co-op. The senior year consists of three terms in college with no co-operative employment.

The four-year co-operative education program consists of 12 terms in college and two terms in co-operative employment. The two terms of co-op experience take place in the third year.

The non–co-operative four-year program comprises 12 terms in school with vacations during the summers.

Other Programs
The *Accelerated Accounting/Taxation Program*, which includes two six-month co-operative education assignments, is a five-year program leading to both a bachelor's and a master's degree. The first four years involve an accelerated undergraduate program (students take their courses over 10 terms instead of the normal 12 terms) and two six-month co-operative assignments. The fifth year involves four terms of graduate study. Students will elect either the MBA or M.S. program and then choose a concentration in either accounting or taxation.

Students wishing to prepare for admission to professional schools may obtain preprofessional counseling from the Office of Preprofessional Programs, 215-895-2437.

The LeBow College of Business offers graduate work leading to the degrees of Master of Business Administration, Master of Science, and Doctor of Philosophy. Certificate programs are also offered. Undergraduate students may not enroll in graduate-level courses. Please see the graduate catalog for full details of all graduate curricula. For additional information, please contact the LeBow College of Business.

The College's *Drexel in London Program* offers flexible schedules for study abroad,

ranging from six-week summer sessions to six-month (two-term) combined study and co-operative education programs in which students can earn up to 18 credits and fulfill one of their co-op requirements. The program's emphasis is on international business in general, with a particular focus on the United Kingdom and the European Union. Business course selections each year will be selected from the list of courses that constitute the international business concentration, but students in other concentrations may participate in the program. Housing is provided in South Kensington, one of central London's most desirable residential sections. Drexel in London applications are administered by the Study Abroad office, 215-895-1704.

Co-operative education, academic eligibility requirements, acceptance of transfer students, and placement services are described in detail in other sections of this catalog.

Degree Requirements
All business administration curricula require a minimum of 186 credits. All commerce and engineering curricula require a minimum of 187 credits. The courses in each curriculum may be grouped into three categories:

General Education
The liberal arts comprise 50 percent or more of total credits required. Courses in communications, economics, English, history, mathematics, natural science, political science, psychology, sociology, and statistics teach students to think effectively and to communicate ideas to others. In addition, they provide a good understanding of the economic, social, and political systems within which we live and business operates.

Common Body of Knowledge in Business
Courses in accounting, business strategy and social responsibility, finance, law, organizational behavior, management information systems, production management, and marketing introduce students to all the functional areas of business, the quantitative aspects of decision-making, and the behavioral factors common to all organizational structures.

Specialization
The curriculum permits a limited degree of specialization in a student-chosen area of concentration. The area of concentration and the common body of knowledge in business together comprise not more than 50 percent of the total credits required for graduation.

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Fields of Concentration
Concentration in one functional field of business is required in all curricula. In selecting an area, students are encouraged to consult the College's academic advisors and the department heads of fields in which they are interested.

After making a choice, students should continue these talks with the advisors and department heads or with faculty in these areas to discuss required courses and

suggested electives. In this way, students have the benefit of continuous counseling in building the best possible background.

The fields of concentration offered are accounting, economics, finance, general business, human resource management, international business (in conjunction with another field of concentration), management information systems, marketing, and operations management. The total credits for concentration courses and business electives are approximately 36 for business administration majors and 28 for commerce and engineering majors.

Dual Concentration
A student who has completed all the course requirements in more than one field of concentration may have this fact noted on his or her final transcript. It is incumbent upon the student to maintain close contact with the concerned department heads and to notify the Dean's Office academic advisors, by the end of the junior year, of the intention to graduate with two areas of concentration.

Minor in Business Administration
The minor in business administration is designed to provide some flexibility while at the same time assuring exposure to a number of critical business functional areas.

Matriculated non-business students who have completed at least 30 credit hours and have a cumulative GPA of 2.0 may apply for an academic minor. Business students may not take the minor in business.

At least 24 credits (eight courses) are required to complete the minor. Under University policy, 9 credits (three courses) required by a student's major are permitted to count toward this total.

Part-time students may enroll in the business administration minor. All prospective students should meet with an advisor from the College as soon as possible. Call 215-895-2110 to set up an appointment.

Of the required credits and courses listed on the Application and Plan of Study form, certain courses are suggested by the College for this minor. However, to provide some flexibility, and to accommodate the restriction on courses that can count from those required by a student's major, additional courses are listed from which the minor can be constituted. The Application and Plan of Study form should be completed with the assistance of an advisor in the Dean's Office. These advisors are familiar with the College's requirements for the minor and with the University's general requirements for a minor field of study.

The Plan of Study can be changed, but only with prior approval of an advisor. This ensures that any change meets all of the requirements for the minor.

The Plan of Study is kept on file and compared to the student's record; a minor is granted only upon completion of the specific courses selected and acknowledged by the signatures on this form. A grade of C (2.0) or better must be earned in each course in the Plan of Study.

The only way to get the minor in business administration noted on a student's official transcript is to have an Application and Plan of Study approved prior to completing the requirements for the minor.

Students minoring in business administration are required to acknowledge all the constraints and conditions specified on the Application and Plan of Study.

Required courses for the minor		Credits
ACCT 111	**Financial Accounting***	3.0
BLAW 201	**Business Law I***	
or		
	Business law choice	4.0
ECON 201	**Economics I***	4.0
or		
ECON 211	**Principles of Economics I (Micro)**	3.0
ECON 202	**Economics II**	4.0
or		
ECON 212	**Principles of Economics II (Macro)**	3.0
FIN 301	**Introduction to Finance***	5.0
or		
FIN 311	**Financial Management**	3.0
MIS 300	**Management Information Systems**	4.0
MKTG 301	**Introduction to Marketing Management***	5.0
ORGB 300	**Organizational Behavior***	4.0
POM 300	**Operations Management***	4.0
or		
POM 311	**Management of Operations**	3.0
STAT 201	**Statistics I**	4.0
STAT 202	**Statistics II**	4.0

***Recommended courses.**

The minor in the LeBow College of Business is composed of a common body of knowledge in business administration, as opposed to a concentration in one specific business area. Therefore, business majors cannot minor in business, since their degree program is in business administration.

Business Administration

Bachelor of Science Degree: 186.0 credits

The co-operative four-year and five-year curricula offer a balanced program of general education, studies in the common body of knowledge, and an area of concentration in one or more of the functional fields of business. Students have the advantages of the co-operative education plan with alternating terms in industry and classes after the freshman year.

The course content of the non-co-operative four-year curriculum is the same as that of the five-year program. The curriculum is offered for those students who wish to complete their education in a four-year period without the benefits of co-op experiences.

Degree Requirements

General education requirements		Credits
BIO 151	**Applied Biology**	3.0
CHEM 151	**Applied Chemistry**	3.0
COM 111	**Principles of Communication**	3.0
COM 270	**Business Communication**	3.0
CS 161	**Introduction to Computing**	3.0
HIST 162	**Themes in World Civilization II**	3.0
HIST 163	**Themes in World Civilization III**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Math Analysis I**	4.0
MATH 102	**Introduction to Math Analysis II**	4.0
PHIL 105	**Critical Reasoning**	3.0
PHYS 151	**Applied Physics**	3.0
PSY 101	**General Psychology**	3.0
SOC 101	**Introduction to Sociology**	
or		
ANTH 101	**Cultural Diversity: Introduction to Cultural Anthropology**	3.0

UNIV B101	**The Drexel Experience**	4.0
	English literature elective: (ENGL 200 through ENGL 300)	3.0
	Non-business electives	17.0

One of the following courses		**4.0**
PSCI 100	**Introduction to Political Science**	
PSCI 110	**American Government**	
PSCI 120	**History of Political Thought**	
PSCI 140	**Introduction to Comparative Political Analysis**	
PSCI 150	**International Politics**	
PSCI 210	**The American Political System**	
PSCI 255	**International Political Economy**	

Business requirements		**Credits**
ACCT 115	**Financial Accounting Foundations**	5.0
ACCT 116	**Managerial Accounting Foundations**	5.0
BLAW 201	**Business Law I**	4.0
BLAW 202	**Business Law II**	4.0
BUSN 101	**Foundations of Business I**	3.0
BUSN 102	**Foundations of Business II**	3.0
BUSN 105	**Special Topics in Business**	1.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
FIN 301	**Financial Management**	5.0
MGMT 450	**Business Policy**	4.0
MGMT 451	**Management Simulation**	
or		
BUSN 444	**Learn by DUing**	4.0
MIS 300	**Management Information Systems**	4.0
MKTG 301	**Introduction to Marketing Management**	5.0
ORGB 300	**Organizational Behavior**	4.0
POM 300	**Operations Management**	4.0

STAT 201	**Statistics I**	4.0
STAT 202	**Statistics II**	4.0
	Concentration/free electives	36.0

One of the following international business courses		**3.0-4.0**
ACCT 336	**Introduction to International Accounting**	
BLAW 340	**International Business Law**	
ECON 340	**International Business**	
FIN 346	**Global Financial Management**	
INTB 332	**Multinational Corporations**	
INTB 334	**International Trade**	
INTB 336	**International Money and Finance**	
MKTG 357	**International Marketing**	

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Commerce and Engineering

Bachelor of Science Degree: 187.0 credits

This four- and five-year program is designed primarily for students seeking to prepare for administrative positions in businesses where competence in engineering and science is important. The curriculum combines the common body of knowledge in business with the fundamentals of engineering education and also requires a concentration in one or more of the functional fields of business.

Degree Requirements

General education requirements		Credits
CS 170	**Computer Programming**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 131	**Calculus for Management and Technology I**	4.0
MATH 132	**Calculus for Management and Technology II**	4.0
MATH 133	**Calculus for Management and Technology III**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
PSY 101	**General Psychology**	3.0
UNIV B101	**The Drexel Experience**	4.0
	Sociology elective: (SOC 101 through SOC 220)	3.0

One of the following courses		4.0
PSCI 100	**Introduction to Political Science**	
PSCI 110	**American Government**	
PSCI 120	**History of Political Thought**	
PSCI 140	**Introduction to Comparative Political Analysis**	
PSCI 150	**International Politics**	
PSCI 210	**The American Political System**	
PSCI 255	**International Political Economy**	

Science and engineering requirements		Credits
CHEM 101	**General Chemistry I**	4.0
CHEM 102	**General Chemistry II**	4.0
ECE 200	**Fundamentals of Intelligent Systems**	3.0
ECE 211	**Electrical Engineering Principles**	3.0
ECE 212	**Electrical Engineering Principles Lab**	1.0
MEM 201	**Fundamentals of Computer-Aided Design**	3.0
MEM 202	**Engineering Mechanics: Statics**	3.0
PHYS 111	**Physics I**	4.5
PHYS 112	**Physics II**	4.5
PHYS 211	**Physics III**	4.5
TDEC 211	**Materials I**	3.0

TDEC 202	**Energy II**	3.0
	Non-business elective*	2.0-4.0

***Science/engineering recommended.**

Business requirements		**Credits**
ACCT 115	**Financial Accounting Foundations**	5.0
ACCT 116	**Managerial Accounting Foundations**	5.0
BLAW 201	**Business Law I**	4.0
BLAW 202	**Business Law II**	4.0
BUSN 101	**Foundations of Business I**	3.0
BUSN 102	**Foundations of Business II**	3.0
BUSN 105	**Special Topics in Business**	1.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
FIN 301	**Financial Management**	5.0
MIS 300	**Management Information Systems**	4.0
MKTG 301	**Introduction to Marketing Management**	5.0
ORGB 300	**Organizational Behavior**	4.0
POM 300	**Operations Management**	4.0
STAT 205	**Statistical Inference I**	4.0
STAT 206	**Statistical Inference II**	4.0
	Concentration/free electives	31.5-33.5

One of the following courses		**4.0**
BUSN 444	**Learn by DUing**	
MGMT 450	**Business Policy**	
MGMT 451	**Management Simulation**	

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Economics

Bachelor of Science Degree: 187.0 credits

The economics major is designed to provide students with an understanding of the market system, as well as economic institutions, policies and development. In addition to this deep coverage of economics, the major includes liberal arts and sciences requirements. The program is flexible, allowing the student to customize the curriculum and choose areas of emphasis ranging from political economy to mathematical economics, as well as to select a coordinating field from other majors and minors at Drexel.

Four-year and five-year co-op programs, as well as a four-year non-co-op option, are available for the economics major. The course content of the non-co-op curriculum is the same as that of the co-op program.

Degree Requirements

General education requirements		Credits
ANTH 101	**Cultural Diversity: Introduction to Cultural Anthropology**	3.0
COM 270	**Business Communication**	3.0
or		
COM 310	**Technical Communication**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Math Analysis I**	4.0
and		
MATH 102	**Introduction to Math Analysis II**	4.0
or		
MATH 121	**Calculus I *(recommended)***	4.0
and		
MATH 122	**Calculus II *(recommended)***	4.0
PSY 101	**General Psychology**	3.0
SOC 101	**Introduction to Sociology**	3.0
UNIV 101	**The Drexel Experience**	4.0
	Fine arts elective	3.0
	Three laboratory science electives	9.0-12.0
	Two English literature electives: (ENGL 200 through ENGL 300)	6.0
	Two history electives	6.0-8.0
	Two philosophy electives	6.0

One of the following courses		3.0
CS 161	**Introduction to Computing**	
CS 170	**Computer Programming**	
CS 171	**Computer Programming I**	

Professional requirements		Credits
ECON 201*	**Economics I**	4.0
ECON 202*	**Economics II**	4.0
ECON 301	**Microeconomics**	4.0
ECON 321	**Macroeconomics**	4.0
ECON 322	**Economics Seminar**	4.0
ECON 350	**Applied Econometrics**	4.0
INTB 334	**International Trade**	4.0
INTB 336	**International Monetary Economics**	4.0
MATH 311	**Probability and Statistics I**	4.0
and		
MATH 312	**Probability and Statistics II**	4.0
or		
STAT 201	**Statistics I**	4.0
and		
STAT 202	**Statistics II**	4.0
*ECON 211-212 may be substituted if the student has already taken 201 and 202 at the time of electing the major.		

Professional Electives (at least 20 credits from the following courses)		20.0
ECON 326	**History of Economic Ideas**	4.0
ECON 330	**Managerial Economics**	4.0
ECON 338	**Industrial Organization**	3.0
ECON 340	**International Business**	3.0
ECON 342	**Economic Development**	4.0
ECON 344	**Comparative Economic Systems**	4.0
ECON 348	**Mathematical Economics**	4.0
ECON 351	**Resource and Environmental Economics**	4.0
ECON 481	**Special Topics in Economics**	.5 -12.0
ENVR 370	**Environmental Economics**	3.0
INTB 332	**Multinational Corporations**	3.0
FIN 301	**Introduction to Finance**	5.0
FIN 325	**Money and Banking**	4.0
SOC 240	**Urban Sociology**	3.0
SOC 260	**Classical Social Theory**	3.0

Additional Electives	
	Additional electives as required to satisfy a coordinating field (a second major or minor) and to meet the minimum requirement of 187.0 credits for the Bachelor of Science Degree.

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Fields of Concentration

Accounting Concentration

This concentration is designed to provide basic conceptual accounting and business knowledge as a foundation for careers in public, private, or governmental accounting. Additional accounting courses may be taken as electives. Actual experience may be obtained under the co-operative program. Any such co-op periods in public accounting may count toward the two years of accounting experience required for the Certified Public Accountant certificate in Pennsylvania and many other states.

Normally a student graduating with a concentration in accounting would qualify to sit for the CPA and CMA examinations. However, some states have specific requirements that may not be met by Drexel's regular program. Interested students should contact the Department of Accounting at the beginning of the third year to ensure ample time to fulfill such requirements.

Students interested in pursuing a dual concentration in accounting and finance should contact the department heads.

Required courses		Credits
ACCT 321	**Intermediate Accounting I**	4.0
ACCT 322	**Intermediate Accounting II**	4.0
ACCT 323	**Advanced Accounting**	4.0
ACCT 331	**Managerial Accounting II**	4.0
ACCT 341	**Principles of Auditing**	4.0
TAX 341	**Individual Income Taxes**	4.0
TAX 342	**Business Income Taxes**	4.0

Recommended elective		
BLAW 321	**Law of Business Organizations**	4.0

The Accelerated Accounting/Taxation Program

This program is designed for students planning to take the Certified Public Accountant Examination and those planning a career in public accounting. It allows students to meet the membership requirements of the American Institute of Certified Public Accountants, which requires 150 semester hours (225 quarter hours) or five years of accounting education. It also enables students to meet the legal requirement of 150 semester hours (225 quarter hours) or five years of accounting education to qualify to take the Certified Public Accountant Examination in 48 jurisdictions, including Maryland and New Jersey. In Pennsylvania, the program qualifies as one of the ways to meet the requirements for taking the CPA exam. The co-operative education assignments may satisfy the one-year experience requirement of most states.

Admission Criteria and Application Procedures

Students apply to the Department of Accounting for admission to the Accelerated Accounting/Taxation Program during the spring term of their first year. If accepted,

their curriculum code is changed to the code for this program, effective the fall term of their second year.

Students must make arrangements with the Office of Co-operative Education to be assigned a co-op cycle (accounting or taxation) upon acceptance to the program. It is imperative that this be done as soon as possible, since most accounting students are normally scheduled to go on co-op assignment in the fall term of their second year, which is in conflict with the accelerated program.

Students must apply to the graduate program (Bachelor's/Master's Dual Degree Program) during the winter term of their second year and take the GMAT exam during their third year. The application process requires students to choose either the MBA or the M.S. program and select a concentration in either accounting or taxation. Students must have a GPA of at least 3.0 at the time of application and acceptance into the program. Upon acceptance, the total number of undergraduate credits required for the bachelor's degree is reduced from 186 to 180; one business elective and one non-business elective are dropped.

Upon completion of 180 undergraduate credit hours, program participants are reclassified as graduate students. Both the bachelor's and the master's degrees are awarded upon completion of the program.

Required Grade Point Average
Students must have a GPA of at least 3.0 when they apply to the Bachelor's/ Master's Dual Degree Program, and must maintain at least a 3.0 throughout the remainder of the program.

Tuition
Participants in the Accelerated Accounting/Taxation Program are billed at the undergraduate four-year co-op tuition rate; the normal graduate credit hour rate applies for graduate courses.

Economics Concentration
Drexel's undergraduate economics concentration has been planned for two groups of students: those who wish to prepare themselves to work for advanced degrees in economics or management and those who want a sound general education. In conformity with current research in economics, Drexel's program places particular emphasis on developing student insight into the application of theory to the solution of specific problems. Beyond learning a language and system of logic, the economics graduate is expected to be able to use the tools of the profession.

For permission to substitute other courses for those listed, students should see the department head.

Required courses		**Credits**
ECON 301	**Microeconomics**	4.0
ECON 321	**Macroeconomics**	4.0
ECON 322	**Economics Seminar**	4.0

Two of the following courses		**6.0-8.0**
ECON 330	**Managerial Economics**	
ECON 334	**Introduction to Public Finance**	
ECON 336	**Labor Economics**	
ECON 338	**Industrial Organization**	

ECON 340	**International Business**
ECON 342	**Economic Development**
ECON 348	**Mathematical Economics**
ECON 350	**Applied Econometrics**
ECON 351	**Resource and Environmental Economics**
INTB 332	**Multinational Corporations**
INTB 334	**International Trade**
INTB 336	**International Money and Finance**

Finance Concentration

Students with a concentration in finance obtain a thorough understanding of the basic concepts, principles, operating procedures, and analytical techniques in the various areas of finance. Throughout the curriculum, students develop and apply quantitative skills for financial decision-making within the business environment.

The concentration prepares students for careers in private business firms, including positions involving forecasting and budgeting for financial resources, cost-effectiveness analysis, control of expenditures, evaluation and financing of new projects, and evaluation of alternative methods of financing; in the investment field, including positions in banks, brokerage houses, and financial institutions that participate in the various money and capital markets; and in the public sector, including positions at the federal, state, and local government levels.

All core mathematics and statistics courses should be completed before embarking on the finance concentration. Because of the relevance of financial accounting to the field of finance, it is strongly recommended that finance students complete ACCT 321 and ACCT 322 (Intermediate Accounting I and II) as two of their business electives.

Required courses		**Credits**
FIN 321	**Investment Securities and Their Markets**	4.0
FIN 323	**Risk Management**	3.0
FIN 325	**Money and Banking**	4.0
FIN 327	**Capital Budgeting**	3.0
FIN 340	**Seminar in Finance**	4.0

One of the following courses		**3.0**
FIN 332	**Investment Analysis**	
FIN 338	**Money and Capital Markets**	
FIN 346	**Global Financial Management**	
FIN 481	**Special Topics in Finance**	

General Business Concentration

This option is provided for those students who do not want to specialize in any one area but want a more extensive exposure to all the various areas of business. The major courses and business electives should be selected from at least five of the following fields: accounting, economics, finance, international business, legal studies, management, marketing, and decision sciences.

The total credits for this concentration should be 36.0 for business administration majors and 28.0 for commerce and engineering majors.

Human Resource Management Concentration

The human resource management concentration concerns the challenge of managing an organization's human resources effectively. The aim is to develop a deep appreciation of the importance of full utilization of all human resources, and to provide the knowledge and skills required for achieving that end.

A wide choice of courses permits students to prepare for industry, government, or union positions, as well as for graduate study. A dual concentration with operations management may be elected, provided that not more than two courses are used to simultaneously satisfy the separate requirements of the two programs.

Required courses		Credits
HRMT 321	**Human Resource Management Analysis and Policy**	4.0
HRMT 323	**Principles of Human Resource Administration**	3.0
HRMT 345	**Seminar in Human Resource Management**	3.0
PSY 250	**Industrial Psychology**	
or		
SOC 215	**Industrial Sociology**	3.0

Two of the following courses		6.0-8.0
BLAW 334	**Labor and Employment Law**	
HRMT 330	**Collective Bargaining**	
HRMT 332	**Problems and Practice of Human Resource Administration**	
POM 321	**Planning of Production and Operations**	
POM 325	**Control of Production and Operations**	
PSY 342	**Counseling Psychology**	
SOC 210	**Race and Ethnic Relations**	

International Business Concentration

International business today finds national boundaries of little import. The information revolution cuts the cost of international transactions and quickens the pace of international commerce, while political upheavals have extended the scope.

The international business concentration allows students to choose from a menu of courses. The curriculum is interdisciplinary, with courses drawn from across business disciplines and anthropology. Specialized operational courses are offered, along with more general theoretical and comparative ones.

Since half of all international business is conducted in English, foreign languages are not a required component of the program; however, students should strongly consider a second or even third language.

This concentration must be taken in conjunction with another field of concentration within the LeBow College of Business.

Required courses		Credits
Six of the following courses		**18.0-21.0**
ACCT 336	**Introduction to International Accounting**	
ANTH 312	**Approaches to Intercultural Behavior**	
BLAW 340	**International Business Law**	
ECON 322	**Economic Seminar***	
ECON 340	**International Business****	
ECON 342	**Economic Development**	
ECON 344	**Comparative Economic Systems**	
FIN 346	**Global Financial Management**	
INTB 332	**Multinational Corporations**	
INTB 334	**International Trade**	
INTB 336	**International Money and Finance**	
INTB 338	**Economic Policy and International Business**	
MGMT 452	**Global Management Strategy and Practices**	
MKTG 357	**International Marketing**	

***The student should take this course only after completing all other requirements for the international business concentration.**

****Students who wish to take ECON 340, a survey course, should do so at the beginning of their concentration.**

Management Information Systems Concentration

This concentration prepares students for many opportunities in the information technology field and business, in careers as managerial users of computers, managers of computer service units, or applications staff members supporting computer-using organizations. Aimed at producing graduates who bridge the gap between technical knowledge and business functions, the program focuses on a mix of applied computer systems content, interpersonal interaction, and a practical business orientation.

While administered by the Department of Management, the concentration in management information systems is interdisciplinary in nature. The courses may be taken by students in other colleges and departments who wish to complement other computer-related studies with business-oriented information systems subjects.

NOTE: Business administration majors with a concentration in MIS are required to take CS 161 (Introduction to Computing). Commerce and engineering majors are required to take CS 170 (Computer Programming).

Required courses		Credits
MIS 341	**Microcomputer Technologies for Business**	3.0
MIS 342	**Systems Analysis and Design**	3.0
MIS 343	**Database Design and Implementation**	4.0
MIS 344	**Networking Technologies for Business**	4.0
MIS 345	**Client/Server Computing for Business**	3.0
MIS 359	**Information Systems Seminar**	3.0

Marketing Concentration

A concentration in marketing prepares students for the many opportunities that exist in product and brand management, marketing research, advertising, retailing, channel management, logistics and physical distribution, professional personal

selling and sales management, purchasing, wholesaling, marketing planning and analysis, public relations, marketing entrepreneurship, and new-product development. In combination with the commerce and engineering curriculum, this concentration prepares students to fill marketing positions that require a technical background.

Required courses		Credits
MKTG 324	**Marketing Channels and Distribution Systems**	4.0
MKTG 344	**Professional Personal Selling**	4.0
MKTG 380	**Seminar in Marketing Strategy**	4.0
	Track courses (see below)	8.0

Marketing Management Track

Two of the following courses		Credits
MKTG 326	**Marketing Research**	4.0
MKTG 348	**Services Marketing**	4.0
MKTG 351	**Marketing for Nonprofit Organizations**	4.0
MKTG 353	**Business-to-Business Marketing**	4.0
MKTG 357	**International Marketing**	4.0
MKTG 358	**Transportation and Logistics**	4.0

Marketing Communications Track

Two of the following courses		Credits
MKTG 321	**Sales Management**	4.0
MKTG 322	**Advertising and Advertising Management**	4.0
MKTG 352	**Sales Promotion**	4.0
MKTG 357	**International Marketing**	4.0

Marketing Analysis Track

Two of the following courses		Credits
MKTG 326	**Marketing Research**	4.0
MKTG 347	**Product Development and Marketing**	4.0
MKTG 354	**Database Marketing**	4.0
MKTG 356	**Consumer Behavior**	4.0
MKTG 360	**Multivariate Data Analysis for Marketers**	4.0

Operations Management Concentration

This field of concentration is designed to prepare students for eventual participation as managers or specialists in the operations activity of industrial and service systems. It stresses a thorough knowledge of the rapidly accumulating analytical techniques in systems analysis, in addition to a full appreciation of all other phases of business. With the proper choice of electives, this concentration also prepares students for graduate studies in industrial management, industrial engineering, management science, or operations research.

Required courses		Credits

POM 321	**Planning of Production and Operations**	4.0
POM 325	**Control of Production and Operations**	4.0
POM 331	**Methods of Operations Research I**	3.0
POM 335	**Methods of Operations Research II**	3.0
POM 341	**Advanced Operations Planning and Control**	3.0
POM 345	**Seminar in Operations Management**	3.0

The College of Engineering

The profession of engineering is concerned with turning the natural elements and energies to the service of mankind. The objectives of the undergraduate program in the College of Engineering are:

- *To offer an education that will give graduates the flexibility to adjust to future changes in technology*
- *To develop a sense of professionalism*
- *To provide a framework for concentrated study in a professional area*

To implement those objectives the curricula of the College of Engineering are designed to provide a firm grounding in basic science and liberal arts, along with broad-based engineering sciences and professional engineering subjects.

Five-year co-operative programs are offered in the following engineering specialties:

- Architectural Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Computer Science
- Electrical Engineering
- Environmental Engineering
- Materials Engineering
- Mechanical Engineering and Mechanics

Engineering majors spend a total of 12 terms in school and six terms on co-op assignment. Freshmen attend classes for three terms. During their sophomore, pre-junior, and junior years, students generally attend class for two terms and are assigned a co-operative employment position for two terms each year.

Students wishing to prepare for admission to professional schools of law or medicine may obtain preprofessional counseling and assistance in making application from the Office of Preprofessional Programs, 215-895-2437.

The College of Engineering offers Master of Science programs in engineering management and software engineering, and master's and Ph.D. programs in chemical engineering, civil engineering, electrical engineering, materials engineering, and mechanical engineering. An Advanced Certificate in Engineering is also offered. For additional information, consult the graduate catalog or contact the graduate division of the College of Engineering.

Co-operative education, academic eligibility requirements, acceptance of transfer students, and placement services are described in detail in other sections of this catalog.

Degree Requirements
The degree of Bachelor of Science in the engineering specialties requires a

minimum of 192 credits of academic work and six terms of co-op or engineering experience. Transfer students must complete a minimum of four terms of industrial/engineering experience in order to earn a co-operative engineering degree accredited by the Accreditation Board for Engineering and Technology (ABET). Non-co-operative engineering degrees are given to students who cannot or do not wish to complete the minimum four terms of co-op experience.

Engineering students must maintain an overall grade point average of 2.0 in all required courses in their major.

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Curricular Organization
With the exception of Computer Science majors, all students in the College of Engineering study the same subjects during the three terms in the first year—the Drexel Engineering Curriculum (tDEC). During the two terms of the sophomore year, there is a high degree of commonality. Students should be able to transfer from one engineering major to another without significant loss of time until the end of the second year.

The first five terms are devoted to those subjects that form the foundation of the engineering curriculum. Courses in the core engineering curriculum are organized and taught to provide an integrated view of the basic sciences and an introduction to the art of engineering through group projects that deal with open-ended problems characteristic of the practice of engineering. Students also learn to use the modern tools of engineering both on the computer and in the laboratory.

The college considers it essential that students entering the Drexel Engineering Curriculum be placed in courses that take advantage of their abilities and prior training. Student preparation level is determined by a review committee that evaluates the student’s high school record, standardized test scores, and placement tests administered during freshman orientation.

Students who demonstrate the preparation and skills to succeed in our integrated engineering calculus course immediately will be placed in the sequences TDEC 110/112/114 and TDEC 111/113/115 starting in the fall term. Students who are not prepared for this sequence should participate in a special "pre-engineering" program before the fall term. These students may also have a modified fall schedule and may need summer school during the following summer.

In the second year, two professional subjects are introduced, and all the first-level professional courses are completed by the junior year. The senior year in all curricula contains at least one elective sequence so that students can study some aspect of engineering more deeply. In addition, all curricula provide a design experience in the senior year. Recognizing the importance of liberal studies in the education of an engineer, all curricula require that courses be taken in this area. These requirements are described under the Liberal Studies Program section.

Mission Statement

The mission of the Drexel Engineering Curriculum is to research, develop, implement, and share educational programs that integrate the foundations of engineering practice, humanities and communications, mathematics, and sciences. The DEC prepares students for professional practice and further education in their selected engineering disciplines. By emphasizing innovative and integrated teaching, the DEC also trains the next generation of engineering educators.

Program Objectives

- *Provide students with a foundation for applying principles of science and mathematics to their disciplinary programs.*
- *Provide students with the skills and technical knowledge to perform engineering design.*
- *Provide students with skills to communicate technical ideas and present persuasive arguments.*
- *Provide students with teamwork skills.*
- *Provide students with understanding of what engineers do through personal experience.*

The Common First Year

Humanities and other courses		Credits
HUM 106	**Humanities and Communications I**	3.0
HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
UNIV E101	**The Drexel Experience (two semesters)**	4.0

Engineering courses		Credits
TDEC 110	**Mathematical Foundations of Engineering I**	3.0
TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0
TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0

Liberal Studies Program

The Liberal Studies Program is designed to give engineering students a foundation in the following areas: English, history of the engineering profession and its impact on modern society, ethical standards required for the practice of the profession, and an in-depth study in a specific discipline in liberal studies.

All engineering majors must take 10 courses. Five of the 10 courses are designated as follows and must be completed by all majors:

Designated liberal studies course requirements	
HIST 285	**Technology in Historical Perspective**
HUM 106	**Humanities and Communications I**
HUM 107	**Humanities and Communications II**
HUM 108	**Humanities and Communications III**
PHIL 315	**Engineering Ethics**

The five remaining liberal studies course requirements are undesignated and can be chosen from the disciplines listed below. Any course selected from the categories below meets this requirement, except language courses below 200 level and survey, performance, studio, or skills courses. Two of the five courses must comprise a sequence and therefore must be in the same discipline, but not necessarily sequentially numbered.

- Anthropology
- Architectural/Social History
- Art History
- Communications
- Dance
- Dramatic Writing
- Film and Video
- History
- Language (200 level and above)
- Literature
- Music
- Philosophy
- Political Science
- Psychology
- Sociology
- Theater

Architectural engineering students' liberal studies requirements are slightly different. The three-course ARCH 141–ARCH 143 (Architecture, Man, and Society) sequence, offered through the College of Media Arts and Design, is required of all architectural engineering students, and fulfills the two-course sequence requirement.

Some engineering majors require a study in basic economic principles. Check curriculum guidelines for requirements. Any required economics courses will replace liberal studies requirements on a course-for-course basis. The acceptable economics courses for engineering majors are ECON 211/212 (Principles of Economics I and II) and ECON 201/202 (Economics I and II).

Electives

In addition to the electives in the Liberal Studies Program there are two types of elective sequences in the engineering curricula: technical electives and free electives.

Technical electives are courses in engineering, science, or management that build on the required professional courses and lead to a specific technical specialization. Possible elective sequences should be discussed with and approved by advisors before the end of the junior year.

Free electives are any courses for which students are eligible and that are not remedial in nature for engineering students.

Withdrawal from the College of Engineering
It is the policy of the College of Engineering that an engineering student who withdraws from the University cannot petition for readmission to the College of Engineering until at least one complete term has elapsed.

Accelerated Program and Bachelor's/Master's Dual Degree Program Dual Degree Program
The Accelerated Program of the College of Engineering provides opportunities for highly talented and strongly motivated students to progress toward their educational goals essentially at their own pace. Primarily through advanced placement, credit by examination, flexibility of scheduling, and independent study, the program makes it possible to complete the undergraduate curriculum and initiate graduate study in less than the five years required by the standard curriculum. Students enrolled in this program may take advantage of the five-year Bachelor's/Master's Dual Degree Program described in the Academic Regulations section of this catalog.

Lincoln University/Drexel 3-3 Plan
Drexel participates in a program with Lincoln University under which a student may attend Lincoln University for three years, taking liberal arts subjects and pre-engineering courses in mathematics, science, and related areas; transfer to Drexel; and receive a degree in engineering after three additional years at Drexel. This is similar to the conventional 3-2 program in which other colleges and universities participate; the extra year is necessitated by Drexel's co-operative education plan.

Indiana University of Pennsylvania/Drexel Plan
Indiana University of Pennsylvania and Drexel University have established a co-operative engineering program to increase the opportunities for young men and women from rural Pennsylvania to pursue careers in engineering. The program combines two years of study at the state-owned university with three years of study as part of the Drexel Plan of Co-operative Education.

Architectural Engineering

Bachelor of Science Degree: 192.0 credits

The architectural engineering major prepares graduates for professional work in the analysis, design, construction, and operation of residential, commercial, institutional, and industrial buildings. The program develops engineers familiar with all aspects of safe and economical construction. Students study the principles of structural support and external cladding, building environmental systems, and project management and develop depth in at least one area.

The program integrates building disciplines, including coordination with architects; construction managers; civil, mechanical, and electrical engineers; and others. Students use computer-aided design tools to understand system interactions; perform analysis, design, scheduling, and cost analysis; and present their work.

The first two years of the curriculum cover fundamentals necessary for all engineers. The pre-junior and junior years emphasize building systems and the principles governing their performance. In addition to the core engineering and science, students learn architectural approaches through studio design. Seniors focus on either structural or building environmental systems design, as well as a full-year realistic design project. The academic program is complemented by exposure to professional practice in the co-op experience.

Mission Statement

The civil and architectural engineering faculty are responsible for delivering an outstanding curriculum that equips our graduates with the broad technical knowledge, design proficiency, professionalism, and communications skills required for them to make substantial contributions to society and to enjoy rewarding careers.

Program Objectives

- *Provide students with a solid scientific and mathematical foundation, knowledge of engineering principles and their application to the solution of problems, and a sense of engineering judgment, which comprise the technical competencies necessary to plan, design, construct, operate, and maintain large-scale building systems and structures*
- *Develop an awareness of mitigating adverse impacts of projects on the social, economic, and natural environments locally, regionally, and globally*
- *Prepare students for professional practice through preparation for professional licensing, development of ethical judgment, and appreciation of lifelong learning and graduate and other advanced study*
- *Provide experience in and develop proficiency for working in multidisciplinary teams; working with the public; and acquiring necessary oral, writing, and graphical communication skills*

Degree Requirements

General education requirements	Credits

ECON 211	**Principles of Economics I (Micro)**	3.0
HUM 106	**Humanities and Communications I**	3.0
HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
PHIL 315	**Engineering Ethics**	3.0
UNIV E101	**The Drexel Experience**	4.0
	Liberal studies electives	9.0

Foundation requirements		**Credits**
TDEC 110	**Mathematical Foundations of Engineering I**	3.0
TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0
TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0
TDEC 201	**Energy I**	3.0
TDEC 202	**Energy II**	3.0
TDEC 211	**Materials I**	3.0
TDEC 212	**Materials II**	3.0
TDEC 221	**Systems I**	3.0
TDEC 222	**Systems II**	3.0
TDEC 231	**Evaluation/Presentation of Experimental Data I**	4.0
TDEC 232	**Evaluation/Presentation of Experimental Data II**	4.0

Major requirements	**Credits**

AE 210	**Introduction to AE Building Systems**	3.0
AE 220	**Introduction to HVAC**	3.5
AE 340	**Architectural Illumination and Electrical Systems**	3.0
AE 390	**Architectural Engineering Design I**	4.0
AE 391	**Architectural Engineering Design II**	4.0
AE 420	**Piping and Special Systems**	3.0
ARCH 141	**Architecture, Man, and Society I**	3.0
ARCH 142	**Architecture, Man, and Society II**	3.0
ARCH 143	**Architecture, Man, and Society III**	3.0
ARCH 191	**Studio I**	3.0
ARCH 192	**Studio 2**	3.0
CHE 311	**Transport Phenomena**	3.0
CIVE 240	**Engineering Economics**	3.0
CIVE 250	**Construction Materials**	4.0
CIVE 300	**Theory of Structures I**	
or		
CIVE 370	**Introduction to Structural Analysis**	3.0
CIVE 301	**Theory of Structures II**	
or		
CIVE 371	**Structural Design**	3.0
CIVE 330	**Hydraulics**	3.5
EGEO 220	**Engineering Geology**	4.0
MEM 202	**Engineering Mechanics: Statics**	3.0
MEM 230	**Mechanics of Materials I**	4.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Mechanical Specialization Requirements		Credits
AE 544	**Building Envelope**	3.0
CAE 491	**Senior Project Design I**	3.0
CAE 492	**Senior Project Design II**	3.0
CAE 493	**Senior Project Design III**	3.0
MEM 310	**Thermal Analysis**	4.0
MEM 345	**Heat Transfer**	4.0
MEM 413	**Air Conditioning and Refrigeration I**	3.0
MEM 414	**Air Conditioning and Refrigeration II**	3.0
	Technical elective	4.0

Structural Specialization Requirements		Credits
AE 544	**Building Envelope**	3.0
CAE 491	**Senior Project Design I**	3.0
CAE 492	**Senior Project Design II**	3.0
CAE 493	**Senior Project Design III**	3.0
CIVE 310	**Soil Mechanics**	4.0
CIVE 400	**Structural Design I**	3.0
CIVE 401	**Structural Design II**	3.0
CIVE 402	**Structural Design III**	3.0
CIVE 410	**Foundation Engineering**	3.0
	Technical elective	3.0

Dual Degree Program: Civil Engineering and Architectural Engineering

A student completing the Bachelor of Science degree program in architectural engineering (structural specialization only) may complete additional courses (specified by the department) to earn the Bachelor of Science degree in civil engineering. (The reverse is difficult because of prerequisites in the sequence of architectural studio design courses, which begins in the sophomore year.)

Chemical Engineering

Bachelor of Science Degree: 192.0 credits

The chemical engineering major has three goals for its students:

- *To educate them so they can perform competently as engineers*
- *To provide them with an understanding of our society*
- *To prepare them to accept responsibility in a rapidly changing technological society*

To help students reach these goals, the curriculum is structured so that they progress through sequences in the fundamental physical sciences, humanities, engineering sciences, and engineering design.

Because chemical engineers have the responsibility for translating the results of chemical research into products for the marketplace, and for preventing the wastes generated by industry from contaminating the environment, the physical sciences sequence includes a strong emphasis on chemistry with courses in organic and physical chemistry. All the courses emphasize modern theories of process analysis and chemistry and are designed to enable students to gain a clearer understanding of their eventual assignments in engineering science and engineering design.

As students progress to courses in engineering science and engineering design, problems of a textbook nature give way to real-world examples. By the senior year, students are involved in comprehensive design projects.

Mission Statement

The chemical engineering faculty are responsible for equipping our graduates with the broad technical knowledge and teamwork skills required for them to make substantial contributions to society.

Program Objectives

- *Provide students with a strong foundation of scientific principles, teamwork methods, and communication skills for the identification and solution of chemical engineering problems*
- *Instill in our students the capacity for self- and group study and experience in self-assessment so that they possess the attributes necessary to continue lifelong learning*
- *Apply elements of public health and safety, concern for the environment, and ethics in the course of studies*
- *Familiarize students with research methodologies*

Degree Requirements

General education requirements		Credits
HIST 285	**Technology in Historical Perspective**	3.0
HUM 106	**Humanities and Communications I**	3.0

HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
PHIL 315	**Engineering Ethics**	3.0
UNIV E101	**The Drexel Experience**	4.0
	Liberal studies electives	15.0
	Free electives	6.0

Foundation requirements		**Credits**
TDEC 110	**Mathematical Foundations of Engineering I**	3.0
TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0
TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0
TDEC 201	**Energy I**	3.0
TDEC 202	**Energy II**	3.0
TDEC 211	**Materials I**	3.0
TDEC 212	**Materials II**	3.0
TDEC 221	**Systems I**	3.0
TDEC 222	**Systems II**	3.0
TDEC 231	**Evaluation/Presentation of Experimental Data I**	4.0
TDEC 232	**Evaluation/Presentation of Experimental Data II**	4.0

Professional requirements		**Credits**
CHE 201	**Process Material Balances**	3.0

CHE 202	**Process Energy Balances**	3.0
CHE 301	**Process Thermodynamics**	3.0
CHE 302	**Process Fluid Mechanics**	4.0
CHE 303	**Process Heat Transfer**	3.0
CHE 304	**Process Mass Transfer**	4.0
CHE 305	**Process Separations**	4.0
CHE 307	**Process Modeling I**	4.0
CHE 308	**Process Modeling II**	4.0
CHE 332	**Chemical Engineering Laboratory I**	2.0
CHE 333	**Chemical Engineering Laboratory II**	2.0
CHE 334	**Chemical Engineering Laboratory III**	2.0
CHE 335	**Statistics and Design of Experiments**	3.0
CHE 420	**Process Systems Engineering**	3.0
CHE 424	**Chemical Kinetics and Reactor Design**	4.0
CHE 481	**Process Design I**	3.0
CHE 482	**Process Design II**	3.0
CHE 483	**Process Design III**	3.0
CHEC 352	**Physical Chemistry and Applications II**	4.0
CHEC 353	**Physical Chemistry and Applications III**	4.0
CHEM 241	**Organic Chemistry I**	4.0
CHEM 242	**Organic Chemistry II**	4.0
CHEM 356	**Physical Chemistry Laboratory I**	2.0
	Concentration electives	12.0

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Graduate-Level Electives

Courses	
CHE 502	**Mathematical Methods in Chemical Engineering**
CHE 513	**Chemical Engineering Thermodynamics**
CHE 525	**Transport Phenomena I**
CHE 543	**Kinetics and Catalysis I**
CHE 554	**Process Systems Engineering**
CHE 562	**Bioreactor Engineering**
CHE 564	**Unit Operations in Bioprocess Systems**

Civil Engineering

Bachelor of Science Degree: 192.5 credits

Civil engineers are active in the planning, design, construction, research and development, operation, maintenance, and rehabilitation of large engineering systems. A particular focus is the reconstruction of the nation's infrastructure through solutions that minimize the disruption of social and natural environments.

Civil engineering graduates are grounded in the fundamental principles necessary for the practice of this profession in any of its modern branches, including construction management, water resources engineering, structural engineering, geotechnical engineering, transportation engineering, and environmental engineering.

Seven of the required courses in the discipline include integral laboratories or field projects for both educational illustration and professional practice exposure.

Careful selection of the electives specified in the curriculum can lead to a wide variety of career objectives. For instance, students with an interest in water resources engineering may elect advanced courses in hydrology, ecology, and chemistry; select senior professional electives in the geotechnical and water resources areas; and choose appropriate topics for senior design and senior seminar. Seniors, with the approval of the department head, can elect certain graduate courses.

Mission Statement

The civil and architectural engineering faculty are responsible for delivering an outstanding curriculum that equips our graduates with the broad technical knowledge, design proficiency, professionalism, and communications skills required for them to make substantial contributions to society and to enjoy rewarding careers.

Program Objectives

- *Provide students with a solid scientific and mathematical foundation, knowledge of engineering principles and their application to the solution of problems, and a sense of engineering judgment, which comprise the technical competencies necessary to plan, design, construct, operate, and maintain large-scale infrastructure, environmental, and natural resource systems and structures*
- *Develop an awareness of mitigating adverse impacts of projects on the social, economic, and natural environments locally, regionally and globally*
- *Prepare students for professional practice through preparation for professional licensing, development of ethical judgment, and appreciation of lifelong learning and graduate and other advanced study*
- *Provide experience in and develop proficiency for working in multidisciplinary teams; working with the public; and acquiring necessary oral, writing, and graphical communication skills*

Degree Requirements

General education requirements		Credits
ECON 211	**Principles of Economics I (Micro)**	3.0
ECON 212	**Principles of Economics II (Macro)**	3.0
HIST 285	**Technology in Historical Perspective**	3.0
HUM 106	**Humanities and Communications I**	3.0
HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
MATH 201	**Linear Algebra**	4.0
STAT 201	**Business Statistics I**	4.0
UNIV E101	**The Drexel Experience**	4.0
	Liberal studies electives	9.0
	Free electives	3.0

Foundation requirements		Credits
TDEC 110	**Mathematical Foundations of Engineering I**	3.0
TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0
TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0
TDEC 201	**Energy I**	3.0
TDEC 202	**Energy II**	3.0
TDEC 211	**Materials I**	3.0
TDEC 212	**Materials II**	3.0
TDEC 221	**Systems I**	3.0

TDEC 222	**Systems II**	3.0
TDEC 231	**Evaluation/Presentation of Experimental Data I**	4.0
TDEC 232	**Evaluation/Presentation of Experimental Data II**	4.0

Major requirements		**Credits**
CAE 491	**Senior Project Design I**	3.0
CAE 492	**Senior Project Design II**	3.0
CAE 493	**Senior Project Design III**	3.0
CHE 311	**Transport Phenomena**	3.0
CIVE 240	**Engineering Economics**	3.0
CIVE 250	**Construction Materials**	4.0
CIVE 251	**Engineering Surveying**	3.0
CIVE 252	**Introduction to Transportation Infrastructure**	3.0
CIVE 300	**Theory of Structures I**	
or		
CIVE 370	**Introduction to Structural Analysis**	3.0
CIVE 301	**Theory of Structures II**	
or		
CIVE 371	**Introduction to Structural Design**	3.0
CIVE 310	**Soil Mechanics I**	4.0
CIVE 330	**Hydraulics I**	3.5
CIVE 341	**Municipal Water Facilities**	3.0
CIVE 360	**Water Quality Infrastructure**	3.0
CIVE 375	**In Situ Material Behavior**	3.0
CIVE 430	**Hydrology**	3.0
CIVE 477	**Seminar I**	2.0
CIVE 478	**Seminar II**	1.0
EGEO 220	**Engineering Geology**	4.0
MEM 202	**Engineering Mechanics: Statics**	3.0
MEM 230	**Mechanics of Materials I**	4.0
	Senior professional electives*	18.0

***A sequence of three courses in a major area of study is required, with a total of six 3-credit professional electives.**

Computer Engineering

Bachelor of Science Degree: 192.0 credits

Computer engineers design smaller, faster, and more reliable computers and digital systems; embed microprocessors in larger systems (e.g. anti-lock brake systems); work in theoretical issues in computing; use object-oriented programming languages; and design large-scale software systems and computer networks. Computer engineers may work in positions that apply computers in control systems, digital signal processing, telecommunications, and power systems, and may design very large-scale integration (VLSI) integrated circuits and systems.

The computer engineering degree program is designed to provide our students with breadth in engineering, the sciences, mathematics, and the humanities, as well as depth in both software and hardware disciplines appropriate for a computer engineer. It embodies the philosophy and style of the Drexel Engineering Curriculum, and will develop the student's design and analytical skills. In combination with the co-op experience, it opens to the student opportunities in engineering practice, advanced training in engineering or in other professions, and an entry to business and administration.

While this program shares all departmental courses with the electrical engineering computer track, it is supplemented with five courses from the Department of Mathematics and Computer Science: Programming I and II, Discrete Mathematics, Data Structures, and Software Engineering. Students gain the depth of knowledge of computer hardware and software essential for the computer engineer.

Mission Statement

The ECE department prepares men and women to lead productive and rewarding professional lives at the forefront of engineering in the 21st century, and pursues research to advance the state of the art in electrical and computer engineering and engineering education.

Program Objectives

- *Provide our students with the core technical competencies in computer engineering, in a manner that recognizes the diversity of our profession and affords the flexibility to pursue different specialization areas*
- *Provide our students with the opportunity to learn in multidisciplinary courses to function as effective team members in an increasingly diverse engineering environment.*
- *Provide our students with the broad education necessary to understand the impact of technology in a global and societal context*
- *Provide our students with practical experiences to facilitate their development as educated professionals in a global and diverse workplace. Through these experiences, expose our student to the need for and desirability of lifelong learning*
- *Develop awareness among our students that research advances the state of knowledge in our profession to serve society better, and provide our qualified students with the opportunity to conduct research as undergraduates*

Degree Requirements

General education requirements		Credits
ECON 211	**Principles of Economics I (Micro)**	3.0
HIST 285	**Technology in Historical Perspective**	3.0
HUM 106	**Humanities and Communications I**	3.0
HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
MATH 290	**Linear Modeling**	4.0
PHIL 315	**Engineering Ethics**	3.0
UNIV E101	**The Drexel Experience**	4.0
	Liberal studies electives	12.0

Foundation requirements		Credits
ECE 200	**Foundations of Intelligent Systems**	3.0
ECE 201	**Foundations of Electric Circuits**	3.0
TDEC 110	**Mathematical Foundations of Engineering I**	3.0
TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0
TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0
TDEC 201	**Energy I**	3.0
TDEC 202	**Energy II**	3.0
TDEC 211	**Materials I**	3.0
TDEC 212	**Materials II**	3.0
TDEC 221	**Systems I**	3.0

TDEC 222	**Systems II**	3.0
TDEC 231	**Evaluation/Presentation of Experimental Data I**	4.0
TDEC 232	**Evaluation/Presentation of Experimental Data II**	4.0

Professional requirements		**Credits**
CS 171	**Computer Programming I**	3.0
CS 172	**Computer Programming II**	3.0
CS 260	**Data Structures**	3.0
CS 451	**Software Engineering**	3.0
ECE 491	**Senior Project Design I**	2.0
ECE 492	**Senior Project Design II**	2.0
ECE 493	**Senior Project Design III**	4.0
ECEC 302	**Digital Systems Projects**	4.0
ECEC 304	**Design with Microcontrollers**	4.0
ECEC 352	**Secure Computing**	4.0
ECEC 355	**Computer Structures**	4.0
ECEL 301	**ECE Laboratory I**	2.0
ECEL 302	**ECE Laboratory II**	2.0
ECEL 303	**ECE Laboratory III**	2.0
ECES 302	**Transform Methods**	4.0
ECES 490	**Special Topics: Errors and Uncertainty**	4.0
ECES 490	**Special Topics: ECE Laboratory IV**	2.0
MATH 221	**Discrete Mathematics**	3.0
	Computer engineering senior sequence	9.0-12.0
	ECE technical electives	9.0-12.0
	Free electives	4.0-10.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Computer Science

Bachelor of Arts Degree: 186.5 credits
Bachelor of Science Degree: 186.5 credits

The program of study in computer science is designed to prepare students for careers in a rapidly changing profession and to allow easy entrance to graduate education in the field. In addition to the courses in the major, the Bachelor of Science program emphasizes foundation courses in the sciences and in applied mathematics, leading to careers involving applications in science and engineering. The Bachelor of Arts degree emphasizes foundation courses in the humanities and the social sciences, leading to careers involving applications in those areas.

Core courses in both programs include programming and data structures, programming language concepts, computer systems architecture, and a track of courses in software methodology and engineering. Students also choose two other tracks from the following: artificial intelligence, data structures and algorithms, numerical and scientific computation, operating systems, programming languages, and human-computer interaction. Please contact the department for a current list of computer science elective and track courses.

Degree requirements for the B.S. and B.A. programs are listed below. The B.S. program is accredited by the Computing Sciences Accreditation Board. Accreditation of the B.A. program will be sought as soon as the program is eligible.

Degree Requirements, B.S. Program

General education requirements		Credits
ECON 211	**Principles of Economics I (Micro)**	3.0
ECON 212	**Principles of Economics II (Macro)**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
PHIL 311	**Computer Ethics**	3.0
UNIV H101	**The Drexel Experience**	4.0
	General education electives	12.0
	Humanities and communication electives	9.0
	History electives	6.0

Science requirements		Credits
	Electives*	25.0

Mathematics requirements		Credits
MATH 121	**Calculus I**	4.0
MATH 122	**Calculus II**	4.0

MATH 123	**Calculus III**	4.0
MATH 200	**Calculus IV**	4.0
MATH 201	**Linear Algebra**	4.0
MATH 221	**Discrete Mathematics**	3.0
MATH 311	**Probability and Statistics I**	4.0
MATH 312	**Probability and Statistics II**	4.0

Computer science requirements		**Credits**
CS 164	**Introduction to Computer Science**	3.0
CS 171	**Computer Programming I**	3.0
CS 172	**Computer Programming II**	3.0
CS 260	**Data Structures**	3.0
CS 270	**Mathematical Foundations of Computer Science**	3.0
CS 281	**Systems Architecture I**	3.0
CS 282	**Systems Architecture II**	3.0
CS 350	**Object-Oriented Programming**	3.0
CS 360	**Programming Language Concepts**	3.0
CS 390	**Advanced Programming Tools and Techniques**	3.0
CS 451	**Software Engineering**	3.0
CS 452	**Software Engineering Workshop I**	3.0
CS 453	**Software Engineering Workshop II**	3.0
ECEC 200	**Fundamentals of Intelligent Systems**	3.0
	Track courses	18.0
	Computer science electives	9.0

Other courses		**Credits**
	Free electives	4.5

Degree Requirements, B.A. Program

General education requirements		**Credits**
ECON 211	**Principles of Economics I (Micro)**	3.0
ECON 212	**Principles of Economics II (Macro)**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
PHIL 311	**Computer Ethics**	3.0
UNIV H101	**The Drexel Experience**	4.0
	General education electives	12.0
	Humanities and communication electives	9.0
	International area studies	6.0
	Social studies electives	12.0
	Women's or African American studies electives	6.0

Science requirements		**Credits**
	Electives*	18.0

***Students must take one full year of a lab science and take courses in more than one science field.**

Mathematics requirements		Credits
MATH 101	**Introduction to Analysis I**	
or		
MATH 121	**Calculus I**	4.0
MATH 102	**Introduction to Analysis II**	
or		
MATH 122	**Calculus II**	4.0
MATH 239	**Intermediate Analysis**	
or		
MATH 123	**Calculus III**	4.0
MATH 221	**Discrete Mathematics**	3.0
MATH 310	**Probability and Statistics**	
or		
MATH 311	**Probability and Statistics I**	4.0

Computer science requirements		Credits
CS 164	**Introduction to Computer Science**	3.0
CS 171	**Computer Programming I**	3.0
CS 172	**Computer Programming II**	3.0
CS 260	**Data Structures**	3.0
CS 270	**Mathematical Foundations of Computer Science**	3.0
CS 281	**Systems Architecture I**	3.0
CS 282	**Systems Architecture II**	3.0
CS 350	**Object-Oriented Programming**	3.0
CS 360	**Programming Language Concepts**	3.0
CS 390	**Advanced Programming Tools and Techniques**	3.0
CS 451	**Software Engineering**	3.0
CS 452	**Software Engineering Workshop I**	3.0
CS 453	**Software Engineering Workshop II**	3.0
ECEC 200	**Fundamentals of Intelligent Systems**	3.0
	Track courses	18.0
	Computer science electives	9.0

Other courses		Credits
	Free electives	15.5

Minor in Computer Science

The computer science minor provides students with a breadth of knowledge in areas which form the foundation of computer science. The student adds some depth by selecting courses from a list of advanced computer science courses.

The requirements for the minor are as follows:

Mathematics Prerequisites

One of the following two-term mathematics sequences must be completed before entering the program:

TDEC 110	**Mathematical Foundations of Engineering I**

TDEC 112	**Mathematical Foundations of Engineering II**
or	
MATH 101	**Introduction to Analysis I**
MATH 102	**Introduction to Analysis II**
or	
MATH 121	**Calculus I**
MATH 122	**Calculus II**
or	
MATH 131	**Calculus for Management and Technology I**
MATH 132	**Calculus for Management and Technology II**

Computer Science Requirements
Students must complete at least 26 credits from courses listed below, subject to the following restrictions:

- *Not more than 9 credit hours may overlap with those counted toward the student's academic major.*
- *All courses listed as required must be completed.*

Remaining credits are to be earned from the list of elective courses.

Required courses		**Credits**
CS 171	**Computer Programming I**	3.0
CS 172	**Computer Programming I**	3.0
CS 260	**Data Structures**	3.0
CS 270	**Mathematical Foundations of Computer Science**	3.0
CS 281	**Systems Architecture I**	
or		
ECEC 221	**Microprocessor Fundamentals**	4.0
CS 360	**Programming Language Concepts**	3.0
ECE 200	**Fundamentals of Intelligent Systems**	3.0

One of the following electives		**3.0-4.0**
CS 282	**Systems Architecture II**	
or		
ECEC 223	**Minicomputer Systems**	
CS 361	**Concurrent Programming**	
CS 370	**Operating Systems**	
CS 380	**Artificial Intelligence**	
CS 451	**Software Engineering I**	

Other courses may be approved as computer science electives (see department for listing).

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Electrical Engineering

Bachelor of Science Degree: 192.0 credits

The Department of Electrical and Computer Engineering has implemented "ECE 21," the new ECE curriculum for the 21st century. ECE 21 emphasizes computer-aided design and hands-on laboratory experience, and flexibility is a major hallmark of the new program. State-of-the-art interdisciplinary courses have been developed to prepare the Drexel engineer for the technical challenges and the business atmosphere of the 21st century. Strong emphasis is given to the role of the engineer in the global competitive economy, and to the need to work closely with experts and practitioners in many fields.

ECE 21 balances technical depth and breadth: depth through the selection of a track and breadth through courses selected in other tracks and the laboratories. It also provides for special cases and special needs.

The track structure, which starts in the pre-junior year and continues through the end of the senior year, allows students to spend time concentrating in one major area of electrical engineering. The structure can accommodate a number of student types and career objectives. Most students will continue to receive traditional or near-traditional ECE education. Those who have non-ECE career objectives can use the senior year to get exposure to languages, business, or management, for example.

The ECE 21 curriculum offers three different tracks, or areas of study: telecommunications/digital signal processing, electronics, and electrical engineering. To fulfill their track requirements, all ECE students will select eight courses. The majority of the core courses will be in their track, while others will be chosen from other tracks or from the computer engineering program. Descriptions and course requirements for each track follow the basic degree requirements.

Mission Statement
The ECE department prepares men and women to lead productive and rewarding professional lives at the forefront of engineering in the 21st century, and pursues research to advance the state of the art in electrical and computer engineering and engineering education.

Program Objectives

- *Provide our students with the core technical competencies in electrical engineering, in a manner that recognizes the diversity of our profession and affords the flexibility to pursue different specialization areas*
- *Provide our students with the opportunity to learn in multidisciplinary courses to function as effective team members in an increasingly diverse engineering environment*
- *Provide our students with the broad education necessary to understand the impact of technology in a global and societal context*
- *Provide our students with practical experiences to facilitate their development as educated professionals in a global and diverse workplace. Through these experiences, expose our student to the need for and desirability of lifelong learning*
- *Develop awareness among our students that research advances the state of knowledge in our profession to serve society better, and provide our qualified*

students with the opportunity to conduct research as undergraduates

Degree Requirements

General education requirements		Credits
ECON 211	**Principles of Economics I (Micro)**	3.0
HIST 285	**Technology in Historical Perspective**	3.0
HUM 106	**Humanities and Communications I**	3.0
HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
MATH 290	**Linear Modeling**	4.0
PHIL 315	**Engineering Ethics**	3.0
UNIV E101	**The Drexel Experience**	4.0
	Liberal studies electives	12.0

Foundation requirements		Credits
ECE 200	**Foundations of Intelligent Systems**	3.0
ECE 201	**Foundations of Electric Circuits**	3.0
TDEC 110	**Mathematical Foundations of Engineering I**	3.0
TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0
TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0
TDEC 201	**Energy I**	3.0
TDEC 202	**Energy II**	3.0

TDEC 211	**Materials I**	3.0
TDEC 212	**Materials II**	3.0
TDEC 221	**Systems I**	3.0
TDEC 222	**Systems II**	3.0
TDEC 231	**Evaluation/Presentation of Experimental Data I**	4.0
TDEC 232	**Evaluation/Presentation of Experimental Data II**	4.0

Professional requirements		**Credit**
ECE 491	**Senior Project Design I**	2.0
ECE 492	**Senior Project Design II**	2.0
ECE 493	**Senior Project Design III**	4.0
ECEL 301	**ECE Laboratory I**	2.0
ECEL 302	**ECE Laboratory II**	2.0
ECEL 303	**ECE Laboratory III**	2.0
ECEL 304	**ECE Laboratory IV**	2.0
	Additional interdisciplinary courses (2)	8.0
	ECE track courses (8)	32.0
	Electrical engineering senior sequence	9.0-12.0
	ECE technical electives	9.0-12.0
	Free electives	0.0-5.0

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Telecommunications/DSP Track
Telecommunications and digital signal processing (DSP) are two of the fastest-growing fields of electrical engineering. The telecommunications/DSP track prepares students for mastery of fundamental and applied knowledge in the theory and the technology of the transmission and processing of information-bearing signals such as voice, audio, data, images, and video. The curriculum includes core courses in electromagnetic propagation, communication devices and media, signal processing, modulation, and coding. Complementary electives can be taken in computers, electronics, control systems, and electric power systems. Senior-level sequence options are available in digital signal processing and communications.

Career opportunities include design and development of digital communications systems and telephony, speech recognition systems, fiber-optic networks, digital radio, medical diagnostic image processing, high-definition television, cellular and wireless communications, satellite communications, networked multimedia communications, and personal communication systems.

Track courses	Credits
ECEE 302 **Electronic Devices**	4.0
ECEE 304 **Electromagnetic Fields and Waves**	4.0
ECES 302 **Transform Methods and Filtering**	4.0
ECES 306 **Introduction to Modulation and Coding**	4.0
ECES 352 **Introduction to Digital Signal Processing**	4.0
ECES 354 **Wireless, Mobile, and Cellular Communications**	4.0
ECES 490 **Errors, Uncertainty, and Reliability**	4.0

Electronics Track

The electronics track constitutes the study of electronic and optical semiconductor devices; analog and digital electronic circuits; and generation, transmission, and reception of information both in optical and microwave frequency ranges and guided or free-space conditions.

Career opportunities include jobs in telecommunications (optical, wireless, wired, satellite, and radar), VLSI (analog and digital), aerospace, remote sensing and instrumentation, computer circuitry interface, biomedical instrumentation, semiconductor device fabrication, and transportation.

Track courses	Credits
ECEE 302 **Electronic Devices**	4.0
ECEE 304 **Electromagnetic Fields and Waves**	4.0
ECEE 352 **Analog Electronics**	4.0
ECEE 354 **Introduction to Wireless and Optical Electronics**	4.0
ECES 302 **Transform Methods and Filtering**	4.0

Electrical Engineering Track

The electrical engineering track has at its core the areas of controls engineering and electric power engineering, the classic core of electrical engineering, and exploits the synergies between these two areas. The track explores subjects such as modeling, analysis and control of dynamic systems including power systems, planning and optimization, electromechanical energy conversion, motor operation and control, transformers, power electronics, sensors and actuators, and the electrical and economic structure of the power industry. The track offers access to two state-of-the-art laboratories. In the Interconnected Power System Laboratory, students can operate and control a small power system through the fusing of computer software and hardware technology with high-voltage, high-power technology. The Ortlip Systems Laboratory houses various experiments in sensing, feedback, and control. Both laboratories stress the use of modeling software, especially MATLAB, and the integrated use of computers and hardware.

Career opportunities include options ranging from manufacturing, the power industry (generation, transmission, distribution, marketing, and consumption), robotics, and transportation to Wall Street.

Track courses		Credits
ECEE 302	**Electronic Devices**	4.0
ECEP 352	**Electric Motor Control Principles**	4.0
ECES 302	**Transform Methods and Filtering**	4.0
ECES 304	**Dynamic Systems and Stability**	4.0
ECES 356	**Theory of Control**	4.0

Environmental Engineering

Bachelor of Science Degree: 202.0 credits

Environmental engineering is concerned with protecting human, animal, and plant populations from the effects of adverse environmental factors, including toxic chemicals and wastes; pathogenic bacteria and global effects such as warming; ozone layer depletion, and weather-pattern change. Environmental engineers also try to minimize the effect of human activities on the physical and living environment. Environmental engineers try to improve the quality of the world around us so that we can all live more healthy lives. This field builds on other branches of engineering, especially civil, chemical, and mechanical engineering. It also builds on information from many of the sciences, such as chemistry, physics, hydrology, geology, atmospheric science, and several specializations of biology (ecology, microbiology, and biochemistry). Students who elect to become environmental engineers will become familiar with many of these areas because maintaining and improving the environment requires that problems be evaluated and solutions found using a multidisciplinary approach.

General education requirements		Credits
ECON 211	**Principles of Economics I (Micro)**	3.0
ECON 212	**Principles of Economics II (Macro)**	3.0
HUM 106	**Humanities and Communications I**	3.0
HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
MATH 310	**Probability and Statistics**	4.0
PHIL 315	**Engineering Ethics**	3.0
UNIV P101	**The Drexel Experience**	4.0
	Liberal studies electives	9.0

Engineering core courses		Credits
TDEC 110	**Mathematical Foundations of Engineering I**	3.0
TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0

TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0
TDEC 201	**Energy I**	3.0
TDEC 202	**Energy II**	3.0
TDEC 211	**Materials I**	3.0
TDEC 212	**Materials II**	3.0
TDEC 221	**Systems I**	3.0
TDEC 222	**Systems II**	3.0
TDEC 231	**Evaluation/Presentation of Experimental Data I**	4.0
TDEC 232	**Evaluation/Presentation of Experimental Data II**	4.0

Environmental engineering requirements		**Credits**
BIO 221	**Microbiology**	5.0
BIO 286	**Ecology II: Communities and Ecosystems**	5.0
CHE 201	**Process Material Balances**	3.0
CHE 311	**Fluid Flow and Transport**	3.0
CHEM 230	**Quantitative Analysis**	3.0
CHEM 231	**Quantitative Analysis Laboratory**	2.0
CHEM 241	**Organic Chemistry I**	4.0
CHEM 242	**Organic Chemistry II**	4.0
CIVE 240	**Engineering Economic Analysis**	3.0
CIVE 331	**Hydraulics I**	3.0
CIVE 430	**Hydrology**	3.0
CIVE 431	**Ground Hydrology**	3.0
EGEO 220	**Engineering Geology**	4.0
ENVE 300	**Environmental Impacts**	3.0

ENVE 302	**Kinetics and Transport**	3.0
ENVR 152	**Environmental Measurement**	3.0
ENVR 260	**Environmental Science and Society I**	3.0
ENVR 401	**Chemistry of the Environment**	3.0
ENVE 410	**Solid and Hazardous Waste**	3.0
ENVE 421	**Water and Waste Treatment II**	3.0
ENVE 422	**Water and Waste Treatment Design**	3.0
ENVE 435	**Groundwater Remediation**	3.0
ENVR 460	**Fundamentals of Air Pollution Control**	3.0
ENVR 480	**Professional Environmental Engineering Practice**	1.0
ENVR 480	**Environmental Engineering Lab I**	1.0
ENVR 480	**Environmental Engineering Lab II**	1.0
ENVR 491	**Senior Project Design I**	3.0
ENVR 492	**Senior Project Design II**	3.0
ENVR 493	**Senior Project Design III**	3.0
	Technical electives	12.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Materials Engineering

Bachelor of Science Degree: 192.0 credits

Materials engineering is concerned with the production, properties, and utilization of metals, ceramics, polymers, composites, and electronic materials. Materials engineers play a vital role in our increasingly complex technological society by extending the limited supply of materials, improving existing materials, and developing new and superior materials and processes with an awareness of cost, reliability, safety, and social/environmental implications.

Students majoring in materials engineering get a thorough grounding in the basic sciences and engineering of all materials. All students are required to take course sequences that include materials processing, thermodynamics and kinetics of materials, and their physical and mechanical behavior, plus laboratories designed to familiarize them with the instruments and techniques for characterizing materials and evaluating their performance. In addition, several required senior courses emphasize the role of materials in design.

A required senior design project, a wide variety of technical elective courses, and co-op experiences allow students in-depth exploration of selected areas.

A minor in materials engineering is also available.

Mission Statement

Our mission is to produce graduates who can excel in leadership positions in industry and academia at the national and international levels.

Program Objectives

- *Educate our students so that they possess the technical competencies required to interface with all engineering disciplines in the workplace*
- *Increase the number of materials engineering graduates who have the aptitude for postgraduate education at the nation's premier engineering institutions or professional schools, and who could become leaders in their chosen fields*
- *Enhance the skills of our undergraduates in experimental methods and modeling, with a focus on materials engineering*
- *Develop an ability in our students to successfully undertake lifelong learning in the discipline and practice of materials engineering or in any other profession*
- *Enhance the verbal and written communication skills of materials engineering students*

Degree Requirements

General education requirements		Credits
ECON 211	**Principles of Economics I (Micro)**	3.0
ECON 212	**Principles of Economics I (Macro)**	3.0

HIST 285	**Technology in Historical Perspective**	3.0
HUM 106	**Humanities and Communications I**	3.0
HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
PHIL 315	**Engineering Ethics**	3.0
UNIV E101	**The Drexel Experience**	4.0
	Technical electives	9.0
	Liberal studies electives	9.0
	Free electives	6.0

Foundation requirements		**Credits**
CHE 310	**Transport Phenomena**	4.0
CHEC 353	**Physical Chemistry and Applications III**	4.0
CHEM 241	**Organic Chemistry I**	4.0
PHYS 451	**Quantum Structure of Materials**	4.0
TDEC 110	**Mathematical Foundations of Engineering I**	3.0
TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0
TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0
TDEC 201	**Energy I**	3.0
TDEC 202	**Energy II**	3.0
TDEC 211	**Materials I**	3.0
TDEC 212	**Materials II**	3.0

TDEC 221	**Systems I**	3.0
TDEC 222	**Systems II**	3.0
TDEC 231	**Evaluation/Presentation of Experimental Data I**	4.0
TDEC 232	**Evaluation/Presentation of Experimental Data II**	4.0

Professional requirements		**Credits**
MATE 130	**Materials Laboratory**	3.0
MATE 216	**Polymers I**	4.5
MATE 240	**Thermodynamics and Kinetics of Materials I**	4.0
MATE 245	**Thermodynamics and Kinetics of Materials II**	4.0
MATE 270	**Advanced Materials Laboratory**	4.0
MATE 315	**Polymers II: Processing**	4.5
MATE 340	**Fundamentals of Ceramics**	4.0
MATE 345	**Ceramics II: Processing and Properties**	4.0
MATE 360	**Metals I**	3.5
MATE 366	**Metals II**	4.5
MATE 370	**Mechanical Properties I**	3.0
MATE 400	**Materials Engineering Design I**	3.0
MATE 410	**Materials Engineering Design II**	3.0
MATE 460	**Engineering Computational Laboratory**	4.0
MATE 472	**Mechanical Properties II**	3.0
MATE 491	**Senior Project Design I**	2.0
MATE 492	**Senior Project Design II**	2.0
MATE 493	**Senior Project Design III**	4.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in Materials Engineering

In addition to the core engineering curriculum and the courses required for the major in chemical, civil, electrical, or mechanical engineering, students electing to pursue the minor in materials engineering must fulfill the following requirements.

Required course		Credits
MATE 130	**Materials Laboratory***	3.0

At least 21.0 credits from the following courses

MATE 216	**Polymers I**	4.5
MATE 240	**Thermodynamics and Kinetics of Materials I**	4.0
MATE 270	**Advanced Materials Laboratory**	4.0
MATE 340	**Fundamentals of Ceramics**	4.0
MATE 360	**Metals I**	3.5
MATE 370	**Mechanical Properties I**	3.0
PHYS 451	**Quantum Structure of Materials**	4.0

***Taken in the sophomore or pre-junior year.**

Substitution for these courses of equivalent courses offered by other departments and/or institutions may be made with the approval of the Department of Materials Engineering on a case-by-case basis. At least two-thirds of the content of a substitute course must be the same as that of the course in the cited list.

Students pursuing the minor are encouraged to select a senior design topic that is relevant to materials.

Mechanical Engineering and Mechanics

Bachelor of Science Degree: 195.0 credits

The role of the mechanical engineer in today's society is rapidly changing. Advances in manufacturing, transportation, infrastructure systems, materials, communications, and high-performance computing have introduced new demands, opportunities, and challenges for mechanical engineers. What was once an individual endeavor has now become a team activity. Today's industries require that mechanical engineers possess diverse interdisciplinary skills, a global viewpoint, entrepreneurial and managerial abilities, and an understanding of the forces governing the marketplace.

Traditionally, mechanical engineers have been associated with industries like automotive, transportation, and power generation, and with activities involving the design, analysis, and manufacturing of products useful to society. While today such activities are still dominated by mechanical engineers, the spectrum of opportunities for these professionals has expanded tremendously. For example, mechanical engineers are involved in the design and analysis of biomedical instrumentation, electronic components, smart structures, and advanced materials; they are involved in sophisticated studies of human motion, control of satellites, and the development of more efficient energy-transfer techniques.

The mission of Drexel's Department of Mechanical Engineering and Mechanics is to provide its students with a comprehensive program of courses, laboratories, design projects, and co-op experiences. The MEM curriculum is designed to balance technical breadth (provided by a set of fundamental required core courses) with technical depth (provided by optional concentrations that emphasize particular fields within the profession). Thus, the MEM program not only prepares its graduates to become successful mechanical engineers needed in industry and government, but also provides an excellent springboard to pursue graduate studies in medical sciences, law, business, information technology, and any other disciplines where technological and analytical skills play an important role.

A minor in mechanical engineering is available to students majoring in other disciplines. The minor consists of 16 credits in the core curriculum and at least 8 credits of elective courses.

Mission Statement

The mission of the Department of Mechanical Engineering and Mechanics of Drexel University is to transfer and acquire knowledge through: (a) the education of engineers for leadership in industry, business, academia, and government; and (b) the establishment of internationally recognized research programs. This mission is accomplished by the delivery of an outstanding curriculum, by the participation of our students in one of the nation's most prestigious co-operative educational programs, and by the scholarly activities of the faculty.

Program Objectives

- *Deliver a comprehensive mechanical engineering curriculum built upon the common tDEC experience, which emphasizes both the foundations and breadth of the mechanical engineering profession*
- *Provide an education that equips students with the tools necessary to become successful mechanical engineers based on their co-op experience,*

strong communication skills, and awareness of the need for continuous professional development

- *Provide an education that will allow mechanical engineering students to understand the social, economic, environmental, political, and ethical importance of their future profession*
- *Provide mechanical engineering students with a thorough understanding of the curriculum and how its content relates to them as students and future engineers*

Degree Requirements

Mathematics requirements		Credits
MATH 290	**Math Modeling for Engineers**	3.0
TDEC 110	**Mathematical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 221	**Systems I**	3.0
TDEC 222	**Systems II**	3.0

Physics requirements		Credits
TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0
TDEC 201	**Energy I**	3.0
TDEC 202	**Energy II**	3.0

Chemistry/biology requirements		Credits
TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0

Design/laboratory requirements		Credits
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0
TDEC 231	**Evaluation and Presentation of Experimental Data I**	4.0
TDEC 232	**Evaluation and Presentation of Experimental Data II**	4.0

Engineering economics requirements		Credits
CIVE 240	**Project Economics and Decisions**	3.0

Liberal studies requirements		Credits
HIST 285	**Technology in Historical Perspective**	3.0
HUM 106	**Humanities and Communications I**	3.0
HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
PHIL 315	**Engineering Ethics**	3.0
UNIV E101	**The Drexel Experience**	4.0

Materials requirements		Credits
TDEC 211	**Materials I**	3.0
TDEC 212	**Materials II**	3.0

Mechanical requirements		Credits
MEM 201	**Fundamentals of CAD**	3.0
MEM 202	**Engineering Mechanics: Statics**	3.0
MEM 220	**Basic Fluid Mechanics**	4.0
MEM 230	**Mechanics of Materials I**	4.0
MEM 238	**Engineering Mechanics: Dynamics**	4.0
MEM 255	**Introduction to Controls**	4.0
MEM 301	**MEM Laboratory I**	2.0
MEM 302	**MEM Laboratory II**	2.0
MEM 303	**MEM Laboratory III**	2.0
MEM 310	**Thermodynamic Analysis I**	4.0
MEM 345	**Heat Transfer**	4.0
MEM 355	**Performance Enhancement of Dynamic Systems**	4.0
MEM 361	**Engineering Reliability**	3.0
MEM 435	**Introduction to CAD/CAM**	4.0

MEM 491	**Senior Design I**	3.0
MEM 492	**Senior Design II**	3.0
MEM 493	**Senior Design III**	3.0

Elective courses		Credits
	Liberal studies	12.0
	MEM designated electives*	12.0
	MEM undesignated electives*	6.0
	MEM/CoE electives**	9.0
	Science/technical electives***	9.0

***All MEM students must complete a minimum of four of the following advanced MEM fundamentals courses, plus any other two MEM courses 300 level or higher:**

Courses		Credits
MEM 320	**Fluid Dynamics I**	3.0
MEM 330	**Mechanics of Materials II**	4.0
MEM 335	**Theory of Machines**	4.0
MEM 410	**Thermodynamics Analysis II**	3.0
MEM 423	**Mechanics of Vibration**	4.0
MEM 440	**Thermal Systems Design**	3.0
MEM 458	**Microcomputer-Based Control Systems I**	3.0
MEM 459	**Microcomputer-Based Control Systems II**	3.0

****Any MEM or College of Engineering course 300 level or higher.**
*****Any science or engineering course 300 level or higher (200 level with prior approval).**

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in Mechanical Engineering

Any undergraduate student in good standing who has completed more than 30 credits at Drexel may apply for the minor in mechanical engineering. The minor must contain a minimum of 24 credits according to the following distribution: (a) 16 credits from any four of the 4-credit required courses; (b) at least eight credits from

additional required courses or from the laboratory components and recommended electives.

Required courses		Credits
MEM 220	**Basic Fluid Mechanics**	4.0
MEM 230	**Mechanics of Materials I**	4.0
MEM 238	**Engineering Mechanics: Dynamics**	4.0
MEM 255	**Introduction to Controls**	4.0
MEM 310	**Thermodynamic Analysis I**	4.0
MEM 345	**Heat Transfer**	4.0
MEM 355	**Control System Design**	4.0
MEM 361	**Engineering Reliability**	3.0
MEM 435	**Introduction to CAD/CAM**	4.0

Laboratories		
MEM 301	**Mechanical Engineering and Mechanics Laboratory I**	2.0
MEM 302	**Mechanical Engineering and Mechanics Laboratory II**	2.0
MEM 303	**Mechanical Engineering and Mechanics Laboratory III**	2.0

Recommended electives		
MEM 320	**Fluid Dynamics I**	3.0
MEM 330	**Mechanics of Materials II**	4.0
MEM 335	**Theory of Machines**	4.0
MEM 410	**Thermodynamic Analysis II**	4.0
MEM 420	**Aerodynamics**	3.0
MEM 423	**Mechanics of Vibration**	4.0
MEM 425	**Aircraft Design and Performance**	3.0
MEM 430	**Advanced Stress Analysis**	4.0
MEM 437	**Manufacturing Process I**	3.0
MEM 438	**Manufacturing Process II**	3.0
MEM 440	**Thermal Systems Design**	3.0
MEM 453	**Aircraft Flight Dynamics and Control I**	3.0

MEM 455	**Introduction to Robotics**	3.0
MEM 458	**Microcomputer-Based Control Systems I**	3.0
MEM 459	**Microcomputer-Based Control Systems II**	3.0
MEM 462	**Introduction to Engineering Management**	3.0

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The College of Information Science and Technology

Drexel's College of Information Science and Technology offers a Bachelor of Science in *Information Systems* to meet the growing demand for individuals skilled in the development and management of information systems. This forward-looking program offers a solid background in liberal arts and sciences as well as the skills and knowledge needed to design, create, manage, and effectively use modern information systems.

The information systems curriculum has no single application focus. It is directed to the art and science of managing information in all application environments. Students learn how to determine information needs, design appropriate information systems, manage those systems, and measure the systems' performance. The emphasis is on the users of computers, and on building professional-level information system skills.

General Information
Information systems, a five-year program involving three six-month periods of co-operative work alternating with periods of regular classwork, is open to freshmen and transfers from other departments at Drexel and other universities. Students have access to the *College of Information Science and Technology's Computing Resource Center* and the computing facilities available to all Drexel students.

Transfer admission occurs in the fall term only due to the sequence of required courses.

The College of Information Science and Technology offers graduate work leading to the degrees of Master of Science, Library and Information Science; Master of Science in Information Systems; Master of Science in Software Engineering; and Doctor of Philosophy. Full details of all graduate curricula are located in the *graduate section* of the catalog.

Co-operative education, academic eligibility requirements, acceptance of transfer students, and placement services are described in detail in other sections of this catalog.

Information Systems

Bachelor of Science Degree: 188.0 credits

The required courses included in the information systems curriculum may be grouped into seven categories:

Information Systems
The 54 credits required in information systems include a 36-credit common core of courses.

Computer Science
The 12 credits required in computer science provide a working knowledge of programming and computation fundamentals for information systems personnel.

Behavioral Science
The strong emphasis on this area indicates the commitment of this program to developing information systems personnel who understand the needs of users and the effects of information systems on various social systems. This 24-credit grouping includes courses in psychology and sociology, and three electives.

Arts and Humanities
This 33-credit grouping includes courses in communications, language, logic, and computer ethics.

Natural Science/Mathematics
This 24-credit grouping includes a choice of basic sciences and mathematics.

Business
This 27-credit grouping includes courses in statistics, economics, and management, and electives.

Other Courses
Ten free credits enable students to devote extra time to any of the areas listed above or to study areas outside the required curriculum. Students are also required to take a four-credit university seminar.

Advanced Coursework
All BSIS students pursue in-depth coursework in fundamental areas such as systems analysis and design and information systems development. All students in the program must also select a focus area as part of advanced coursework. Students receive one or more initial courses in these areas as part of the core requirements. They take at least two additional courses in the focus area during advanced coursework. The focus areas are:

Database Management Systems
Coursework in databases and systems analysis addresses database design and development, database administration, application of databases in information systems, and modeling of data and information requirements. This prepares students for careers in applied database technology, database development, and database administration.

Distributed Computing and Networking
Coursework in distributed information systems, applications of networking, and Internet computing. This prepares students for careers in network design and administration, network operations and support, and design and development of Internet information systems.

Human-Centered Computing
Coursework in human-computer interaction, computer-supported cooperative work, and systems analysis addresses the human and organizational aspects of information systems and how those elements affect successful system implementation. This prepares students for careers as interface designers and developers and administrators of messaging, work-flow, and collaborative systems.

Information Retrieval and Analysis
Coursework in information retrieval, use and evaluation of information resources, and managing information content in databases, information repositories, and on the Internet. This prepares students for careers in information services and information resource management.

Computer Science
Coursework in computer science topics beyond the introductory computer science and programming sequence. This focus area is for students combining significant computer science interests (typically a minor) with a major in information systems. Selection of this focus area requires approval of an undergraduate advisor. This prepares students for careers emphasizing software development, systems software, and applications in science and mathematics.

Degree Requirements

Information systems requirements		**Credits**
ISYS 101	**Introduction to Information Systems I**	3.0
ISYS 102	**Introduction to Information Systems II**	3.0
ISYS 105	**Information Evaluation, Organization, and Use**	3.0
ISYS 110	**Human-Computer Interaction I**	3.0
ISYS 140	**Information Systems Laboratory I**	1.0
ISYS 141	**Information Systems Laboratory II**	1.0
ISYS 142	**Information Systems Laboratory III**	1.0
ISYS 200	**Systems Analysis I**	3.0
ISYS 210	**Database Management Systems**	3.0
ISYS 350	**Distributed Computing and Networking**	3.0
ISYS 355	**Systems Analysis II**	3.0
ISYS 420	**Software Project Management**	3.0
ISYS 425	**Design Problem I**	2.0
ISYS 426	**Design Problem II**	4.0
	Concentration courses	6.0
	Electives	12.0

Behavioral science requirements		**Credits**
PSY 101	**General Psychology**	3.0
PSY 330	**Cognitive Psychology**	3.0
SOC 101	**Introduction to Sociology**	
or		
ANTH 101	**Cultural Diversity**	3.0

SOC 250	**Research Methods I**	3.0
SOC 350	**Research Methods II**	3.0
	Electives	9.0

Computer science requirements		**Credits**
CS 390	**Computer Programming A**	3.0
CS 390	**Computer Programming B**	
or		
CS 171	**Computer Programming I**	3.0
CS 390	**Computer Programming C**	
or		
CS 172	**Computer Programming II**	3.0
CS 390	**Computer Programming D**	
or		
CS 260	**Data Structures**	3.0

Mathematics/natural science requirements		
MATH 101	**Introduction to Analysis I**	
or		
MATH 121	**Calculus I**	4.0
MATH 102	**Introduction to Analysis II**	
or		
MATH 122	**Calculus II**	4.0
MATH 123	**Calculus III**	
or		
MATH 180	**Discrete Computational Structures**	4.0
	Natural science sequence	8.0-9.0
	Elective	3.0-4.0

Arts/humanities requirements		
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
PHIL 105	**Critical Reasoning**	3.0
PHIL 111	**Beginning Logic**	3.0
PHIL 311	**Computer Ethics**	3.0
COM 230	**Techniques of Speaking**	3.0
COM 310	**Writing**	3.0
	Electives	9.0

Other courses		**Credits**
UNIV I101	**The Drexel Experience**	4.0
	Electives	10.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in Business

IST students who take all their courses at Drexel will qualify for the minor in business. Transfer students may or may not qualify for the minor depending on individual circumstances, but all BSIS students will have the credit equivalent of a minor.

Business minor requirements		Credits
ACCT 111	**Financial Accounting**	3.0
ECON 211	**Economics I**	3.0
ECON 212	**Economics II**	3.0
ORGB 300	**Organizational Behavior**	4.0
STAT 201	**Statistics I**	4.0
STAT 202	**Statistics II**	4.0

At least two of the following		6.0
BLAW 201	**Business Law I**	
FIN 311	**Financial Management**	
MKTG 301	**Introduction to Marketing Management**	
POM 311	**Management of Operations**	

Minor in Information Systems

The information systems minor is available to all University students in good standing, with the exception of information systems majors. A minimum of 24 credits is needed to complete the academic minor in information systems.

Required courses		Credits
ISYS 102	**Introduction to Information Systems II**	3.0
ISYS 110	**Human-Computer Interaction I**	3.0
ISYS 200	**Systems Analysis I**	3.0
ISYS 210	**Database Management Systems**	3.0
ISYS 350	**Distributed Computing and Networking**	3.0
ISYS 355	**Systems Analysis II**	3.0

An additional 6 credits or more are to be chosen from other course offerings in information systems pertinent to the student’s overall program of study. Guidance in selecting these electives will be provided by staff and faculty of the College of Information Science and Technology.

The College of Media Arts and Design

The College of Media Arts and Design is a center for studying both the process and the products of design in the human environment and on media. Curricula concentrate on design as a process that can be defined, understood, and applied to solve human problems. Students study conceptualization and implementation of ideas within a creative environment involving aesthetics, function, ethics, technology, and the realities of the marketplace. They focus on the use of artifacts of daily life and react to creations that reflect the human condition. Common to most of the college's undergraduate curricula is a visual core that provides a foundation of design knowledge.

The purpose of each program is to encourage design and creation.

Consistent with Drexel's philosophy of co-operative education, periodic, full-time, paid employment is required of most students in the college. Students' specializations determine the timing and number of terms of their co-op experiences.

Students select a major from one of the following programs leading (except as noted) to the Bachelor of Science degree:

- Architecture (Bachelor of Architecture degree)
- Design and Merchandising
- Digital Media
- Dramatic Writing
- Fashion Design
- Film and Video
- Graphic Design
- Interior Design
- Music Industry
- Photography
- Studies in Media Arts and Design

The undergraduate College is comprised of the following departments:

- Department of Design
- Department of Media Arts
- Department of Performing Arts
- Department of Visual Studies

The College offers graduate curricula in architecture, arts administration, fashion design, and interior design. For additional information consult the Drexel graduate catalog or contact the College.

The undergraduate curricula include general education requirements, program and professional requirements, and electives. A minimum of 180 credits is required for graduation, except where noted.

Architecture

Bachelor of Architecture Degree: 194.0 credits

The practice of architecture calls for creative thinking and aesthetic sensitivity, technical and management skills, inventive and scientific knowledge, cultural understanding and social responsibility, and the ability to communicate with those in related disciplines. Therefore, the curriculum in architecture is broad, including courses in the physical and social sciences and the humanities as well as professional courses in the field of architecture. This broad education allows for various career objectives, both in architecture and in related fields.

The Two+Four Option
The Two+Four Option is an accelerated route into the part-time evening degree program in architecture leading to a Bachelor of Architecture degree. The two years of full-time study address the basic principles of architectural design and cover fundamental University core requirements in the arts and sciences as well as those job-related skills that are needed for entry-level professional positions. A comprehensive review of performance will take place after the first year to ensure that students are making sufficient progress in all areas. After successfully completing the minimum requirements of the full-time phase, students will start full-time employment and continue their studies on a part-time basis in the evening program for four additional years. In the Two+Four sequence, 101 of the 194 credits required for graduation are completed in the first two years.

The Part-Time Evening Program
The Part-Time Evening Program leads to a Bachelor of Architecture degree. The course of study usually takes seven years to complete. Since all courses are offered in the evening, students are expected to supplement their academic work with full-time employment in architectural offices. Please contact the Richard C. Goodwin College of Evening and Professional Studies at 215-895-2159 for further information.

Accreditation
The Bachelor of Architecture degree program at Drexel is accredited by the National Architectural Accrediting Board (NAAB). Please note that the *Two+Four Option* and the Part-Time Evening Program are both integral parts of the accredited Bachelor of Architecture degree program.

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes two types of degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a five-year, three-year, or two-year term of accreditation, depending on its degree of conformance with established educational standards.

Master's degree programs may consist of a preprofessional undergraduate degree and a professional graduate degree, which, when earned sequentially, comprise an accredited professional education. However, the preprofessional degree is not, by itself, recognized as an accredited degree.

General education requirements (2+4 option)		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Mathematical Analysis I**	4.0
MATH 102	**Mathematical Analysis II**	4.0
PHYS 103	**General Physics I**	4.0
PHYS 104	**General Physics II**	4.0
UNIV A101	**The Drexel Experience**	4.0
	Humanities and social science electives	9.0
	Electives	12.0

Departmental requirements (2+4 option)		Credits
ARCH 101	**Studio 1-A**	4.5
ARCH 102	**Studio 1-B**	4.5
ARCH 103	**Studio 2-A**	4.5
ARCH 104	**Studio 2-B**	4.5
ARCH 105	**Studio 3-A**	4.5
ARCH 106	**Studio 3-B**	4.5
ARCH 241	**Studio 4-1**	3.0
ARCH 242	**Studio 4-2**	3.0
ARCH 243	**Studio 4-3**	3.0
ARCH 351	**Studio 5-1**	3.0
ARCH 352	**Studio 5-2**	3.0
ARCH 353	**Studio 5-3**	3.0
ARCH 361	**Studio 6-1**	3.0
ARCH 362	**Studio 6-2**	3.0
ARCH 363	**Studio 6-3**	3.0
ARCH 496	**Thesis I**	6.0
ARCH 497	**Thesis II**	6.0
ARCH 498	**Thesis III**	6.0

Professional courses (2+4 option)		Credits
ARCH 141	**Architecture, Man, and Society I**	3.0
ARCH 142	**Architecture, Man, and Society II**	3.0
ARCH 143	**Architecture, Man, and Society III**	3.0
ARCH 150	**Introduction to CADD**	3.0
ARCH 151	**Architectural Drawing I**	3.0
ARCH 152	**Architectural Drawing II**	3.0
ARCH 161	**Architectural Construction**	3.0
ARCH 261	**Environmental Systems I**	3.0
ARCH 262	**Environmental Systems II**	3.0
ARCH 263	**Environmental Systems III**	3.0
ARCH 321	**General Lecture Series I**	3.0
ARCH 322	**General Lecture Series II**	3.0
ARCH 323	**General Lecture Series III**	3.0
CIVE 261	**Materials and Structural Behavior I**	3.0
CIVE 262	**Materials and Structural Behavior II**	3.0
CIVE 263	**Materials and Structural Behavior III**	3.0

VSST 110	**Introductory Drawing**	3.0

History and theory electives		**Credits**
Three or four of the following courses		**12.0**
ARCH 341	**Theories of Architecture I**	
ARCH 342	**Theories of Architecture II**	
ARCH 343	**Theories of Architecture III**	
ARCH 344	**History of the Modern Movement I**	
ARCH 345	**History of the Modern Movement II**	
ARCH 346	**History of Philadelphia Architecture**	
ARCH 347	**Summer Study Abroad (6 credits)**	
ARCH 348	**Studies in Vernacular Architecture**	
ARCH 441	**Urban Design Seminar I**	
ARCH 442	**Urban Design Seminar II**	
ARCH 499	**Special Topics in Architecture**	

Professional electives		**Credits**
Any three of the following courses*		**9.0**
ARCH 421	**Environmental Psychology and Design Theory**	
ARCH 431	**Architectural Programming**	
ARCH 432	**The Development Process**	
ARCH 435	**Management Seminar I**	
ARCH 436	**Management Seminar II**	
ARCH 451	**Advanced Drawing**	
ARCH 455	**Computer Applications in Architecture I**	
ARCH 456	**Computer Applications in Architecture II**	
ARCH 461	**Technology Seminar I**	
ARCH 462	**Technology Seminar II**	
ARCH 465	**Energy and Architecture**	
ARCH 499	**Special Topics in Architecture**	
CIVE 400	**Structural Design I**	
CIVE 401	**Structural Design II**	
CIVE 402	**Structural Design III**	
CIVE 464	**Acoustics and Noise Control in Buildings I**	

***History and theory electives can also be used to satisfy professional elective requirements.**

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minor in Architecture

A minor in architecture permits students to explore architecture through a coherent sequence of coursework and to prepare for professional graduate study in this field. The minor consists of 27 credits divided among design studio courses, courses in

architectural history, and architecture elective courses. Interested students should consult with the department head for course selection and scheduling.

Required courses		Credits
ARCH 141	**Architecture, Man, and Society I**	3.0
ARCH 142	**Architecture, Man, and Society II**	3.0
ARCH 143	**Architecture, Man, and Society III**	3.0
	Elective architecture courses*	9.0

Three of the following**		**9.0**
ARCH 191	**Studio 1**	
or		
ARCH 111	**Studio 1-1**	
ARCH 192	**Studio 2**	
or		
ARCH 112	**Studio 1-2**	
ARCH 113	**Studio 1-3**	
ARCH 121	**Studio 2-1**	
ARCH 122	**Studio 2-2**	
ARCH 123	**Studio 2-3**	

***Chosen from Department of Architecture history/theory electives and professional electives appearing on this page.**

****Students who have successfully completed INTR 233 should enter the studio sequence at the second-year level (ARCH 121). Students who have successfully completed ARCH 192 should start the studio sequence with ARCH 113.**

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Department of Design

The goal of the Department of Design is the education of the student as a professional through teaching excellence, scholarship, research, and co-operative education. The department offers the following majors:

- Design and Merchandising
- Fashion Design
- Interior Design

In preparing students for these professional pursuits, the department provides a visual foundation, a professional concentration, a liberal arts foundation, and co-operative education.

The objectives of this comprehensive education are to enable students to work effectively by identifying, researching, and creatively solving problems within the practice of their chosen discipline and to make intellectual judgments in response to the continual cultural and aesthetic changes of society. Faculty members work collectively to endow students with a sense of pride and achievement in their work, thus enabling the students to review and renew their abilities on the threshold of their disciplines.

Students in the Department of Design and the Department of Media Arts study essentially the same subjects during the first three terms. This recognizes fundamental knowledge common to the disciplines, and it also provides opportunity for transfer between some majors at the end of the freshman year without loss of time.

Design and Merchandising

Bachelor of Science Degree: 180.0 credits

The design and merchandising major prepares students to make merchandising and marketing decisions based on a knowledge of visual/aesthetic and business considerations. Design and merchandising students develop an appreciation for style, product quality, and design; learn to communicate verbally and visually about design; and gain the business skills and knowledge required to promote and defend an aesthetically grounded point of view in the marketplace.

Design and merchandising majors typically focus study in the areas of fashion retail merchandising or product development. Elective credits may be used for a concentration in design and merchandising, retail merchandising and product development, or marketing, and for providing an option to minor in business administration or another discipline or to pursue specific educational goals.

Design and merchandise students are invited to spend a term of their junior year in the College's study abroad program, Drexel in London, earning up to 18 credits. The program's emphasis is on understanding British culture and the global implications of the retail merchandising industries.

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 119	**Mathematical Foundations for Design**	4.0
PHYS 121	**Physical Science for Design I**	4.0
PHYS 122	**Physical Science for Design II**	4.0
UNIV A101	**The Drexel Experience**	4.0
	Arts and humanities electives	9.0
	Social science electives	9.0
	Unrestricted electives	39.0
	Co-operative education (two terms)	0.0

Visual studies requirements		Credits
ARTH 101	**History of Art I: Ancient to Medieval**	3.0
ARTH 102	**History of Art II: Renaissance to Modern**	3.0
ARTH 103	**History of Art III: Early Modern to Postmodernism**	3.0

PHTO 110	**Photography**	3.0
VSST 101	**Design I**	4.0
VSST 102	**Design II**	4.0
VSST 103	**Design III**	4.0
VSST 110	**Introductory Drawing**	3.0
VSST 111	**Figure Drawing**	3.0
VSST 201	**Multimedia: Performance**	4.0
VSST 202	**Multimedia: Space**	4.0
VSST 203	**Multimedia: Materials**	4.0
VSST 211	**Textiles**	3.0

Design and merchandising requirements		**Credits**
ACCT 115	**Financial Accounting I**	5.0
ARTH 300	**History of Modern Design**	3.0
DSMR 210	**Presentation Techniques in Design and Merchandising**	3.0
DSMR 311	**Visual Merchandising I**	4.0
DSMR 431	**Introduction to Retail Marketing**	3.0
DSMR 432	**Retail Buying and Merchandising**	4.0
DSMR 477	**Design and Merchandising Seminar**	3.0
DSMR 496	**Senior Problem in Design and Merchandising**	3.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
FASH 201	**Survey of the Fashion Industry**	3.0
MKTG 301	**Introduction to Marketing Management**	5.0
VSCM 100	**Computer Imaging I**	3.0
	Art history electives	6.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Fashion Design

Bachelor of Science Degree: 182.0 credits

The fashion design major prepares students for professional employment in the apparel industry as fashion designers, stylists, or technical designers. Graduates are also prepared to work in positions that demand creative design ability in display, computer-aided design, advertising, and merchandising. Students exhibit their collections competitively in the annual fashion show.

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 119	**Mathematical Foundations for Design**	4.0
PHYS 121	**Physical Science for Design I**	4.0
PHYS 122	**Physical Science for Design II**	4.0
UNIV A101	**The Drexel Experience**	4.0
	Arts and humanities electives	9.0
	Social science electives	9.0
	Unrestricted electives	22.0
	Co-operative education (three terms)	0.0

Visual studies requirements		Credits
ARTH 101	**History of Art I: Ancient to Medieval**	3.0
ARTH 102	**History of Art II: Renaissance to Modern**	3.0
ARTH 103	**History of Art III: Early Modern to Postmodernism**	3.0
PHTO 110	**Photography**	3.0
VSST 101	**Design I**	4.0
VSST 102	**Design II**	4.0
VSST 103	**Design III**	4.0
VSST 110	**Introductory Drawing**	3.0
VSST 111	**Figure Drawing I**	3.0
VSST 204	**Materials Exploration**	4.0
VSST 211	**Textiles**	3.0
VSST 301	**Painting I**	4.0

One of the following courses		4.0
VSST 201	**Multimedia: Performance**	
VSST 202	**Multimedia: Space**	
VSST 203	**Multimedia: Materials**	

Fashion design requirements		Credits

ARTH 335	**History of Costume I: Preclassical to Directoire**	3.0
ARTH 336	**History of Costume II: Directoire to World War I**	3.0
FASH 201	**Survey of the Fashion Industry**	3.0
FASH 210	**Presentation Techniques in Fashion Design**	3.0
FASH 211	**Fashion Drawing I**	3.0
FASH 212	**Fashion Drawing II**	3.0
FASH 220	**Textile Design**	3.0
FASH 241	**Construction Skills**	4.0
FASH 251	**Fashion Design I**	4.0
FASH 252	**Fashion Design II**	4.0
FASH 313	**Fashion Drawing for Industry**	3.0
FASH 314	**Fashion Presentation Drawing**	3.0
FASH 315	**CAD Patternmaking**	
or		
FASH 316	**CAD for Fashion Design**	3.0
FASH 341	**Flat Pattern Design**	4.0
FASH 342	**Draping Design**	4.0
FASH 343	**Tailoring and Design**	4.0
FASH 351	**Fashion Design III**	4.0
FASH 352	**Fashion Design IV**	4.0
FASH 491	**Senior Problem in Fashion Design: Phase I**	4.0
FASH 492	**Senior Problem in Fashion Design: Phase II**	3.0
VSST 112	**Figure Drawing II**	3.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Interior Design

Bachelor of Science Degree: 183.0 credits

The interior design major educates students to design spaces aesthetically and functionally. The program is rooted in design and is supported by a visual studies foundation that provides a broad base of knowledge in design and the fine arts and by a broad spectrum of general education courses. Scientific and quantitative knowledge, historical and cultural understanding, social and behavioral forces, and the ability to communicate are addressed through the general education requirements.

The mission of the interior design program is to educate the student as a developing professional through academic coursework and entry-level co-operative employment and to instill an aspiration for lifelong learning. The curriculum prepares students for employment with interior firms and architectural offices and in facilities design and management. The program is accredited by the Foundation for Interior Design Education Research (FIDER).

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 119	**Mathematical Foundations for Design**	4.0
PHYS 121	**Physical Science for Design I**	4.0
PHYS 122	**Physical Science for Design II**	4.0
UNIV A101	**The Drexel Experience**	4.0
	Arts and humanities electives	9.0
	Social science electives	9.0
	Electives	19.0-21.0
	Co-operative education (two terms)	0.0

Visual studies requirements		Credits
ARTH 101	**History of Art I: Ancient to Medieval**	3.0
ARTH 102	**History of Art II: Renaissance to Modern**	3.0
ARTH 103	**History of Art III: Early Modern to Postmodernism**	3.0
PHTO 110	**Photography**	3.0
VSST 101	**Design I**	4.0
VSST 102	**Design II**	4.0
VSST 103	**Design III**	4.0

VSST 110	**Introductory Drawing**	3.0
VSST 201	**Multimedia: Performance**	
or		
VSST 202	**Multimedia: Space**	4.0
VSST 203	**Multimedia: Materials**	4.0
VSST 211	**Textiles**	3.0
VSST 301	**Painting I**	4.0
VSST 311	**Sculpture I**	4.0
	Art and design studio electives*	6.0-8.0

***INTR 465 (Special Topics: Lighting) is a designated art and design studio elective in the interior design major.**

Interior design requirements		**Credits**
INTR 150	**Issues of the Interior Environment**	3.0
INTR 200	**History of Modern Architecture**	3.0
INTR 220	**Orthographic Drawing**	3.0
INTR 231	**Structure**	4.0
INTR 232	**Interior Studio I**	4.0
INTR 233	**Interior Studio II**	4.0
INTR 240	**Perspective Drawing I**	3.0
INTR 245	**CAD for Interior Design**	3.0
INTR 250	**Interior Materials**	3.0
INTR 251	**Interior Systems**	3.0
INTR 300	**Directions in 20th-Century Interior Design**	
or		
ARTH 330	**History of Interior Space and Furnishing**	3.0
INTR 331	**Residential Design Studio**	4.0
INTR 332	**Hospitality Design Studio**	4.0
INTR 340	**Interior Detailing**	3.0
INTR 430	**Commercial Design Studio**	4.0
INTR 435	**Topical Issues Studio**	4.0
INTR 440	**Environmental Drawing**	3.0
INTR 445	**Contract Documentation for InteriorDesign**	3.0
INTR 450	**Codes and Professional Practice for Interior Design**	3.0
VSST 119	**Drawing for Interiors**	3.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Department of Media Arts

The Department of Media Arts offers five undergraduate programs:

- Digital Media
- Dramatic Writing
- Film and Video
- Graphic Design
- Photography

Each program includes a liberal arts component, a visual studies foundation, a co-operative education experience, and an extensive, project-oriented major curriculum.

All media arts programs are oriented toward production and creation. Production classes are small and allow students to share their projects in a workshop setting. Students master both the technology and the craft, develop their initial ideas into finished products, and present their work in final critiques.

Each program ensures that students develop an intellectual grasp of the major traditions, critical theories, and emerging issues informing their chosen profession. Faculty members teaching in media arts programs practice professionally and do research in their fields of specialization. Students completing media arts programs leave Drexel prepared to compete successfully in their major field and, especially, to adapt to rapid changes in media technology and culture.

Digital Media

Bachelor of Science Degree: 185.0 credits

The digital media program is a broad and robust course of study covering traditional design techniques and cutting-edge new technologies taught in the framework of a university education. Students take a host of courses, from three-dimensional modeling and timeline design to multimedia authoring and advanced interactivity for the Internet.

Students also take courses in the humanities, social sciences, mathematics, and natural sciences. Graduates are prepared for innovative careers in a variety of environments, from small boutique media companies to large corporate production houses and from medical imaging labs to visual-effect studios.

General education requirements		**Credits**
COM 230	**Techniques of Speaking**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 119	**Mathematical Foundations for Design**	4.0
PHYS 121	**Physical Science for Design I**	4.0
PHYS 122	**Physical Science for Design II**	4.0
UNIV 101	**The Drexel Experience**	4.0
	Arts and humanities electives	6.0
	History elective	3.0
	Literature elective	3.0
	Philosophy elective	3.0
	Social science electives	9.0
	Unrestricted electives	20.0-21.0

Visual studies requirements		**Credits**
ARTH 103	**History of Art III**	3.0
ARTH 300	**History of Modern Design**	3.0
VSCM 100	**Computer Imaging I**	3.0
VSST 101	**Design I**	4.0
VSST 102	**Design II**	4.0
VSST 110	**Introductory Drawing**	3.0

One of the following courses		**3.0**
ARTH 101	**History of Art I**	
ARTH 102	**History of Art II**	
VSST 465	**Special Topics in Art History**	

One of the following courses		3.0-4.0
VSST 103	**Design III**	
VSST 111	**Figure Drawing I**	
VSST 201	**Multimedia: Performance**	
VSST 202	**Multimedia: Space**	
VSST 301	**Painting I**	

Media foundation requirements		Credits
CS 171	**Computer Programming I**	3.0
CS 172	**Computer Programming II**	3.0
FMVD 105	**Fundamentals of Video Production**	3.0
FMVD 150	**American Classic Cinema**	
or		
FMVD 270	**Scriptwriting I**	3.0
FMVD 215	**Dramatic Video Production**	3.0
ISYS 110	**Human-Computer Interaction**	4.0
PHTO 110	**Photography**	3.0
PHTO 240	**Digital Photography**	4.0
VSCM 230	**Visual Communication I**	4.0
VSCM 240	**Typography I**	3.0

Digital media requirements		Credits
DIGM 115	**3-D Modeling/Design**	3.0
DIGM 150	**Overview of Digital Media**	3.0
DIGM 203	**Multimedia Timeline Design**	3.0
DIGM 211	**Computer Animation I**	3.0
DIGM 212	**Computer Animation II**	3.0
DIGM 240	**Introduction to Interactivity**	3.0
DIGM 241	**Multimedia Authoring**	3.0
DIGM 242	**Advanced Interactivity for the Internet**	3.0
DIGM 250	**Professional Practices**	3.0
DIGM 319	**Art and Techniques of Digital Compositing**	3.0
DIGM 321	**Digital Audio**	3.0
DIGM 475	**Seminar: The Future of Digital Media**	3.0
DIGM 492	**Senior Project in Digital Media I**	3.0
DIGM 493	**Senior Project in Digital Media II**	3.0

Five of the following courses		15.0
DIGM 314	**Character Animation I**	
DIGM 315	**Character Animation II**	
DIGM 350	**Digital Storytelling and Cultural Production**	
DIGM 411	**Advanced Animation and Visual Effects**	
DIGM 440	**Interactive Game Development**	
DIGM 445	**Advanced Hybrid Interactivity**	
DIGM 451	**Explorations in New Media**	

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minors in Digital Media

The two digital media minors provide foundations in the production and management of digital assets, the design and creation of 2D and 3D computer graphics, animation, and multimedia. Additional study is done in media arts.

3D Modeling/Animation Minor

Required courses		Credits
DIGM 115	**3D Modeling/Design**	3.0
DIGM 203	**Multimedia Timeline Design**	3.0
DIGM 211	**Computer Animation I**	3.0
FMVD 105	**Fundamentals of Video Production**	3.0
VSCM 100	**Computer Imaging I**	3.0
VSST 110	**Introductory Drawing**	3.0

Three of the following courses		9.0
DIGM 150	**Overview of Digital Media**	
DIGM 314	**Character Animation I**	
DIGM 315	**Character Animation II**	
DIGM 350	**Digital Storytelling and Cultural Production**	
DIGM 411	**Advanced Animation and Visual Effects**	

Interactivity Minor

Required courses		Credits
DIGM 203	**Multimedia Timeline Design**	3.0
DIGM 240	**Introduction to Interactivity**	3.0
DIGM 241	**Multimedia Authoring**	3.0
PHTO 110	**Photography**	3.0
VSCM 100	**Computer Imaging I**	3.0
	Computer programming courses	6.0

Two of the following courses		6.0
DIGM 150	**Overview of Digital Media**	
DIGM 242	**Advanced Interactivity for the Internet**	
DIGM 350	**Digital Storytelling and Cultural Production**	
DIGM 445	**Advanced Hybrid Interactivity**	

Dramatic Writing

Bachelor of Science Degree: 182.0 credits

Students in the dramatic writing program begin the lifelong process of accumulating a writer's capital: the ideas, understandings, facts, and methods of perception, as well as the technical knowledge, needed to write compellingly for the stage or screen. Students learn to create scripts that meet current industry standards for feature film and television production and acquire hands-on experience in the techniques of film and video production. Graduates of this program will be prepared to pursue careers in any of numerous fields that require dramatic writing or to enter one of the highly competitive graduate programs in dramatic writing.

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 119	**Mathematical Foundations for Design**	4.0
PHYS 121	**Physical Science for Design I**	4.0
PHYS 122	**Physical Science for Design II**	4.0
UNIV A101	**The Drexel Experience**	4.0
	Arts and humanities electives (excluding ENGL courses)	9.0
	Social science electives	9.0
	Electives	35.0
	Co-operative education (two terms)	0.0

Visual studies requirements		Credits
ARTH 101	**History of Art I: Ancient to Medieval**	3.0
ARTH 102	**History of Art II: Renaissance to Modern**	3.0
MUSC 130	**Introduction to Music**	3.0
PHTO 110	**Photography**	3.0
VSST 101	**Design I**	4.0
VSST 102	**Design II**	4.0

Literature requirements		Credits
ENGL 203	**Masterworks of Non-Western Literature I**	

or

ENGL 204	**Masterworks of Non-Western Literature II**	3.0
ENGL 315	**Shakespeare**	3.0
	Literature electives	6.0

One of the following courses		**3.0**
ENGL 200	**Masterworks of Western Literature I**	
ENGL 201	**Masterworks of Western Literature II**	
ENGL 202	**Masterworks of Western Literature III**	

Cinema studies/theatre studies requirements		**Credits**
ENGL 216	**Readings in Drama**	3.0
FMVD 150	**American Classic Cinema**	3.0
FMVD 350	**World Cinema**	3.0
THTR 120	**Introduction to Theatre**	3.0
THTR 380	**Special Topics in Theatre**	3.0
	Cinema studies elective	3.0

Methods requirements		**Credits**
FMVD 105	**Fundamentals of Video Production**	3.0
FMVD 215	**Dramatic Video Production**	3.0
FMVD 230	**Basic Filmmaking**	3.0
THTR 210	**Acting I**	3.0
THTR 240	**Theatre Production I**	3.0
THTR 320	**Play Direction I**	3.0

Writing requirements		**Credits**
DRWT 220	**Playwriting I**	3.0
DRWT 225	**Playwriting II**	3.0
DRWT 495	**Senior Project in Dramatic Writing I**	3.0
DRWT 496	**Senior Project in Dramatic Writing II**	3.0
FMVD 270	**Scriptwriting I**	3.0
FMVD 275	**Scriptwriting II**	3.0

FMVD 285	**Writing for Nonfiction Film and Video**	3.0
WRIT 225	**Creative Writing**	3.0

One of the following course sequences		**6.0**
DRWT 382	**Playwriting Workshop I**	
DRWT 383	**Playwriting Workshop II**	
or		
FMVD 382	**Screenwriting Workshop I**	
FMVD 383	**Screenwriting Workshop II**	

One of the following courses		**3.0**
COM 260	**Fundamentals of Journalism**	
COM 280	**Public Relations**	
FMVD 280	**Copywriting**	
PRFA 310	**Performing Arts Evaluation and Criticism**	
WRIT 220	**Advanced Expository Writing**	

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Film and Video

Bachelor of Science Degree: 182.0 credits

The film and video major enables students to acquire a broad education in the liberal arts and the foundations of design as well as solid preparation for a professional career in film and video. In the core program, students develop talent and expertise as film and video makers. The program emphasizes production but includes substantial work in screenwriting and cinema studies.

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 119	**Mathematical Foundations for Design**	4.0
PHYS 121	**Physical Science for Design I**	4.0
PHYS 122	**Physical Science for Design II**	4.0
UNIV A101	**The Drexel Experience**	4.0
	History electives	6.0
	Literature electives	6.0
	Philosophy electives	6.0
	Social science electives	9.0
	Electives	40.0
	Co-operative education (two terms)	0.0

Visual studies requirements		Credits
ARTH 101	**History of Art I: Ancient to Medieval**	3.0
ARTH 102	**History of Art II: Renaissance to Modern**	3.0
ARTH 103	**History of Art III: Early Modern to Postmodernism**	
or		
VSST 110	**Introductory Drawing**	3.0
PHTO 110	**Photography**	3.0
VSCM 100	**Computer Imaging I**	3.0
VSST 101	**Design I**	4.0
VSST	**102 Design II**	4.0
VSST 201	**Multimedia: Performance**	4.0

Film and video requirements		Credits
FMVD 105	**Fundamentals of Video Production**	3.0
FMVD 125	**Basic Television Studio**	3.0
FMVD 150	**American Classic Cinema**	3.0
FMVD 205	**Professions in Film and Video**	3.0
FMVD 210	**Documentary Video Production**	3.0
FMVD 215	**Dramatic Video Production**	3.0
FMVD 225	**Advanced Television Studio**	
or		
FMVD 330	**Advanced Filmmaking**	3.0

FMVD 230	**Basic Filmmaking**	3.0
FMVD 235	**Lighting for Film and Video**	3.0
FMVD 250	**The Documentary Tradition**	3.0
FMVD 255	**Hitchcock**	3.0
FMVD 270	**Scriptwriting I**	3.0
FMVD 275	**Scriptwriting II**	3.0
FMVD 350	**World Cinema**	3.0
FMVD 365	**Special Topics in Production**	3.0
FMVD 495	**Senior Project in Film and Video**	6.0

One of the following two-course sequences		**6.0**
FMVD 322	**Production Workshop I**	
FMVD 323	**Production Workshop II**	
or		
FMVD 382	**Screenwriting Workshop I**	
FMVD 383	**Screenwriting Workshop II**	

Two of the following courses		**6.0**
FMVD 240	**Film/Video Management**	
FMVD 260	**The Western**	
FMVD 262	**Film Comedy**	
FMVD 265	**Special Topics in Cinema Studies**	
FMVD 285	**Writing for Nonfiction Film and Video**	
FMVD 355	**Contemporary Cinema**	
FMVD 360	**Television Aesthetics**	

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Minors in Film and Video

Each of the three minors in film and video requires eight courses, for a total of 24 credits. FMVD 105, FMVD 150, and FMVD 270 are common to each minor.

Cinema Studies Minor

Required courses		**Credits**
FMVD 105	**Fundamentals of Video Production**	3.0
FMVD 150	**American Classic Cinema**	3.0
FMVD 255	**Hitchcock**	3.0
FMVD 270	**Scriptwriting I**	3.0

Four of the following courses		**12.0**
FMVD 250	**The DocumentaryTradition**	
FMVD 260	**The Western**	
FMVD 262	**Film Comedy**	

FMVD 265	**Special Topics in Cinema Studies**
FMVD 350	**World Cinema**
FMVD 355	**Contemporary Cinema**
FMVD 360	**Television Aesthetics**

Video Production Minor

Required courses		**Credits**
FMVD 105	**Fundamentals of Video Production**	3.0
FMVD 125	**Basic Television Studio**	3.0
FMVD 150	**American Classic Cinema**	3.0
FMVD 210	**Documentary Video Production**	
or		
FMVD 215	**Dramatic Video Production**	3.0
FMVD 270	**Scriptwriting I**	3.0
FMVD 322	**Production Workshop I**	3.0
FMVD 323	**Production Workshop II**	3.0

One of the following courses	**3.0**

FMVD 225	**Advanced Television Studio**
FMVD 230	**Basic Filmmaking**
FMVD 235	**Lighting for Film and Video**
FMVD 365	**Special Topics in Production**

Writing for the Media Minor

Required courses		**Credits**
FMVD 105	**Fundamentals of Video Production**	3.0
FMVD 150	**American Classic Cinema**	3.0
FMVD 270	**Scriptwriting I**	3.0
FMVD 275	**Scriptwriting II**	3.0
FMVD 280	**Copywriting**	3.0
FMVD 382	**Screenwriting Workshop I**	3.0
FMVD 383	**Screenwriting Workshop II**	3.0
WRIT 225	**Creative Writing**	3.0

Graphic Design

Bachelor of Science Degree: 182.0 credits

The graphic design major presents students with a broad range of two- and three-dimensional design problems. The major prepares students to take a sophisticated approach to typography, image generation, computer graphics, corporate identity programs, information graphics, and packaging design. Students are encouraged to develop an aesthetic point of view while maintaining interest in a variety of forms and applications. Graduates are employed by such businesses as advertising agencies, design studios, corporate design departments, and publishers.

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 119	**Mathematical Foundations for Design**	4.0
PHYS 121	**Physical Science for Design I**	4.0
PHYS 122	**Physical Science for Design II**	4.0
UNIV A101	**The Drexel Experience**	4.0
	Arts and humanities electives	9.0
	Social science electives	9.0
	Unrestricted electives	25.0
	Co-operative education (two terms)	0.0

Visual studies requirements		Credits
ARTH 101	**History of Art I: Ancient to Medieval**	3.0
ARTH 102	**History of Art II: Renaissance to Modern**	3.0
ARTH 103	**History of Art III: Early Modern to Postmodernism**	3.0
PHTO 110	**Photography**	3.0
VSST 101	**Design I**	4.0
VSST 102	**Design II**	4.0
VSST 103	**Design III**	4.0
VSST 110	**Introductory Drawing**	3.0
VSST 111	**Figure Drawing I**	3.0
VSST 301	**Painting I**	4.0
VSST 302	**Painting II**	4.0
VSST 311	**Sculpture I**	4.0

Two of the following courses **8.0**

VSST 201	**Multimedia: Performance**
VSST 202	**Multimedia: Space**
VSST 203	**Multimedia: Materials**

Graphic design requirements		Credits
ARTH 300	**History of Modern Design**	3.0
PHTO 210	**Intermediate Photography**	3.0
VSCM 100	**Computer Imaging I**	3.0
VSCM 200	**Computer Imaging II**	3.0
VSCM 230	**Visual Communication I**	4.0
VSCM 231	**Visual Communication II**	4.0
VSCM 232	**Visual Communication III**	4.0
VSCM 240	**Typography I**	3.0
VSCM 241	**Production**	3.0
VSCM 242	**Typography II**	3.0
VSCM 330	**Visual Communication IV**	4.0
VSCM 331	**Visual Communication V**	4.0
VSCM 340	**Typography III**	3.0
VSCM 430	**Visual Communication VI**	4.0
VSCM 440	**Book Design**	3.0
VSCM 460	**Professional Practice**	
or		
VSCM 477	**Graphic Design Seminar**	3.0
VSCM 496	**Senior Thesis in Graphic Design**	3.0
VSST 118	**Drawing for Graphic Design**	3.0
VSST 321	**Silkscreen**	4.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

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Photography

Bachelor of Science Degree: 180.0 credits

The photography major provides students with a unified fine arts/professional curriculum offering a wide range of studio, real-world, and academic experiences—intermixed with ongoing critiques and evaluation—including the studio, the darkroom, and the computer. The major prepares students to understand photography as a system of visual communication with its foundation in an ever-changing technology. Graduates may be employed in a variety of photo-related businesses, initiate their own photographic enterprises, or choose to go on to advanced studies.

General education requirements		**Credits**
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 119	**Mathematical Foundations for Design**	4.0
PHYS 121	**Physical Science for Design I**	4.0
PHYS 122	**Physical Science for Design II**	4.0
UNIV A101	**The Drexel Experience**	4.0
	Arts and humanities electives	9.0
	Social science electives	9.0
	Unrestricted electives	33.0
	Co-operative education (two terms)	0.0

Visual studies requirements		**Credits**
ARTH 101	**History of Art I: Ancient to Medieval**	3.0
ARTH 102	**History of Art II: Renaissance to Modern**	3.0
ARTH 103	**History of Art III: Early Modern to Postmodernism**	3.0
PHTO 110	**Photography**	3.0
VSST 101	**Design I**	4.0
VSST 102	**Design II**	4.0
VSST 103	**Design III**	4.0
VSST 110	**Introductory Drawing**	3.0
VSST 111	**Figure Drawing I**	3.0
VSST 301	**Painting I**	4.0

Two of the following courses		**8.0**
VSST 201	**Multimedia: Performance**	
VSST 202	**Multimedia: Space**	
VSST 203	**Multimedia: Materials**	

Photography requirements		**Credits**
FMVD 105	**Fundamentals of Video Production**	3.0

PHTO 130	**Photography I**	1.0
PHTO 210	**Intermediate Photography**	3.0
PHTO 230	**Photography II**	1.0
PHTO 231	**Color Photography**	4.0
PHTO 233	**Large-Format Photography**	4.0
PHTO 234	**Studio Photography**	4.0
PHTO 236	**Photojournalism**	4.0
PHTO 240	**Digital Photography**	4.0
PHTO 253	**Fine Black-and-White Printing**	3.0
PHTO 275	**History of Photography I**	3.0
PHTO 276	**History of Photography II**	3.0
PHTO 350	**Photography and Culture**	3.0
PHTO 361	**Advanced Photography**	4.0
PHTO 392	**Junior Project in Photography**	3.0
PHTO 451	**Photography and Business**	3.0
PHTO 492	**Senior Project in Photography I**	3.0
VSCM 100	**Computer Imaging I**	3.0
	Special topics in photography	6.0

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Department of Performing Arts

The Department of Performing Arts offers a Bachelor of Science degree in

- Music Industry

The degree in music industry offers the highly motivated and musically focused student a program of study that combines coursework in the business and technological aspects of the music industry and continued study in the art of music. The curriculum provides a strong base in the liberal arts. This is in keeping with the philosophy of the College of Media Arts and Design—that of a broad education in partnership with professional studies.

Minors in Performing Arts

TheDepartment of Performing Arts offers several minors in performing arts.These minors are designed to allow students from other departments and colleges to pursue the advanced study of the performing arts within the context of their major field of interest. Students wishing either a music history option or a music theory option, rather than the general option, can select music electives accordingly.

Dance Minor

Required courses		Credits
DANC 150	**Modern Dance Technique**	3.0
DANC 325	**20th-Century Dance**	3.0
DANC 355	**Rhythmic Study for Dance**	3.0
DANC 450	**Choreography—Solo Composition**	3.0
MUSC 130	**Introduction to Music**	3.0
THTR 240	**Theatre Production I**	3.0
	Electives in Dance (DANC 201-DANC 495)	6.0
	Dance practicum (6 terms from DANC 131-DANC 133)	0.0

Music Minor

Required courses		Credits
MUSC 121	**Music Theory I**	3.0
MUSC 125	**Ear Training I***	1.0
MUSC 126	**Ear Training II***	1.0
MUSC 130	**Introduction to Music**	3.0

MUSC 331	**World Music***	3.0
	Applied music	6.0
	Music ensemble (6 terms from MUSC 101 to MUSC 115)	0.0
	Music electives*	9.0

***These requirements must be completed at Drexel.**

Performing Arts Minor

Required courses		Credits
DANC 210	**Introduction to Dance**	3.0
MUSC 130	**Introduction to Music**	3.0
	Applied music (one of MUSC 180–MUSC 182)	3.0
THTR 120	**Introduction to Theatre**	3.0
	Theatre elective	3.0
	Dance elective	3.0
	Performing arts electives	7.0
	Performing arts practicum (6 terms from MUSC 101-MUSC 115, THTR 131-THTR 133, and/or DANC 131-DANC 133)	0.0

Theatre Performance Minor

Required courses		Credits
DANC 150	**Modern Dance Technique**	3.0
THTR 120	**Introduction to Theatre**	3.0
THTR 210	**Acting I**	3.0
THTR 211	**Acting II**	3.0
THTR 240	**Theatre Production I**	3.0
THTR 320	**Play Direction I**	3.0
	Theatre electives	6.0
	Theatre practicum (6 terms from THTR 131-THTR 133)	0.0

Theatre Production Minor

Required courses		Credits
THTR 120	**Introduction to Theatre**	3.0
THTR 210	**Acting I**	3.0
THTR 240	**Theatre Production I**	3.0
THTR 241	**Theatre Production II***	3.0
THTR 380	**Special Topics in Theatre (Design)**	6.0

Theatre electives	6.0
Theatre practicum (6 terms from THTR 131-THTR 133)	0.0

***Students whose interest is costume design should substitute ARTH 335 (History of Costume).**

Music Industry

Department of Science Degree: 184.0 credits

The music industry curriculum is divided into three areas, which are combined with co-operative experience: general education, music core, and music industry. By working in various aspects of the industry in two three-month periods of full-time career-related employment, students gain valuable insights into how the entertainment industry works.

In an industry where the process of building a career often begins with a few key contacts, the co-operative education program gives Drexel students the chance to begin meeting people and networking. The program prepares students for employment in the music industry in such diverse positions as recording engineer, sound engineer, sound designer, music lawyer, business manager, personal manager, and music publisher.

General education requirements		**Credits**
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Analysis I**	4.0
MATH 102	**Introduction to Analysis II**	4.0
PHYS 121	**Physical Science for Design I**	4.0
PHYS 122	**Physical Science for Design II**	4.0
COM 230	**Techniques of Speaking**	3.0
UNIV 101	**The Drexel Experience**	4.0
	Arts and humanities electives	9.0
	Social science electives	9.0
	Unrestricted electives	21.0

Music core requirements

Music theory, ear training, and creation		**Credits**
MUSC 121	**Music Theory I**	3.0
MUSC 122	**Music Theory II**	3.0
MUSC 123	**Music Theory III**	3.0
MUSC 125	**Ear Training I**	1.0
MUSC 126	**Ear Training II**	1.0
MUSC 127	**Ear Training III**	1.0
MUSC 229	**Orchestrating and Arranging**	3.0
MUSC 231	**Music History I**	3.0
MUSC 235	**Music History II**	3.0
MUSC 323	**Songwriting**	3.0
MUSC 331	**World Musics**	3.0
MUSC 338	**American Popular Music**	3.0

Applied music and ensemble		Credits
MUSC 141	**Applied Major I**	2.0
MUSC 142	**Applied Major II**	2.0
MUSC 143	**Applied Major III**	2.0
MUSC 241	**Applied Major IV**	2.0
MUSC 242	**Applied Major V**	2.0
MUSC 243	**Applied Major VI**	2.0
MUSC 271	**Beginning Class Piano**	2.0
MUSC 272	**Advanced Class Piano**	2.0
	Music ensembles	6.0
	Music electives	6.0

Music industry requirements		Credits
MUSC 150	**Acoustics**	3.0
MUSC 151	**Sound Reinforcement**	3.0
MUSC 156	**Computer Applications in Music**	3.0
MUSC 157	**Digital Audio Production**	3.0
MUSC 227	**Listening Techniques for Music Production**	1.0
MUSC 259	**Recording I**	3.0
MUSC 261	**Music Business I**	3.0
MUSC 352	**Recording II**	3.0
MUSC 353	**Recording Session**	3.0
MUSC 361	**Music Business II**	3.0
MUSC 450	**Audio for Video**	3.0
MUSC 461	**Music Business III**	3.0
MUSC 491	**Senior Project in Music Industry**	3.0
ACCT 111	**Financial Accounting***	3.0
BLAW 211	**Legal Options***	3.0
ECON 211	**Principles of Economics I***	3.0
FIN 311	**Financial Management***	3.0
MKTG 311	**Introduction to Marketing Management***	3.0
STAT 311	**Quantitative Analysis I***	3.0

***These courses may count toward an MBA.**

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Department of Visual Studies

The Department of Visual Studies develops and delivers courses in art history, design, aesthetics, and the fine arts. This visual core provides a foundation of design knowledge that is common to most of the College's undergraduate curricula. Its purpose is to encourage design and creation and the response to objects, ideas, and space.

The Department of Visual Studies also administers the Bachelor of Science in

- Studies in Media Arts and Design

Studies in Media Arts and Design

Bachelor of Science Degree: 180.0 credits

A small number of students in the College of Media Arts and Design decide that their goals lie at the periphery of the major or the intersection between several majors and would be served by more latitude than offered in the highly specified courses in their major. For these students, the studies in media arts and design major broadens future career goals and allows exploration combined with a focused exposure to a second field. It acknowledges the specialization that is characteristic of the majors in the College and the expectations of the professional fields for which our students are being prepared. Simultaneously, it recognizes the breadth and rapidly changing nature of many disciplines and permits a student who has acquired a basic working knowledge of a specific aspect of media arts and design to investigate a clearly defined alternative.

Admission to the program is limited to currently matriculated College of Media Arts and Design students who have completed the major-intensive sophomore year and experienced a co-op placement or completed their junior-year courses. The following items are required as part of the application:

- *A student-generated, individualized plan of study, developed with and signed by a member of the Studies in Media Arts and Design Advisors Committee*
- *A statement in writing of the student's goals in applying to the major and the rationale of how the proposed plan of study addresses those goals*
- *A definition of appropriate co-operative education placement if the student has not completed a six-month employment in the field of his or her major*
- *A letter from the student's current program director*

Approval by the Studies in Media Arts and Design Advisors Committee is required for admission to the major; it is not automatic upon request. The committee must be convinced by the validity of the applicant's reasons for applying, the proposed study plan, and accompanying documentation. Details about the application procedure may be obtained from the director of Studies in Media Arts and Design.

Degree Requirements

General education requirements		Credits
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Research**	3.0
UNIV A101	**The Drexel Experience**	4.0
	Arts and humanities electives	9.0
	Mathematics and natural science electives*	12.0
	Social science electives	9.0
	Co-operative education**	0.0

***At least one course in mathematics and one course in natural science are required.**

****Not required if prior major did not require co-operative education experience.**

Other requirements

Unrestricted electives	max of 75.0
Professional requirements***	min of 51.0
Concentration or minor****	min of 24.0

*****All professional and visual studies courses required in prior major through winter term of junior year must be successfully completed.**

****** Up to 9 credits of general education and professional requirements may be included in this minimum.**

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

The College of Nursing and Health Professions

The College of Nursing offers the following undergraduate programs:

- Addictions Counseling Sciences
- Behavioral Counseling Sciences
- Biomedical Sciences
- Cardiovascular Perfusion Technology
- Emergency Medical Services
- Health Education and Related Training (HEART)
- Humanities and Social Sciences
- Nursing
- Radiologic Technology

For additional information about admissions and academic regulations see the College of Nursing and Health Professions' undergraduate information page.

Addictions Counseling

Bachelor of Science Degree: 120 credits

Designed for full- or part-time students entering third-year undergraduate studies, this program responds to increasing national awareness that comprehensive treatment in primary health care includes roles for competent, credentialed addictions counselors and prevention specialists. The learning model incorporates didactic classroom experiences with case study and field placements to allow for an integrated, holistic framework within which students learn counseling and prevention skills. Particular attention is given to preparing students for professional practice in multidisciplinary and multicultural behavioral health care settings.

Curriculum

The curriculum is designed to meet all standards for knowledge, values, and practice competencies currently set by state and national certification and licensure agencies. In particular, competencies are inclusive of the following learning areas: assessment, treatment planning, counseling, service coordination, documentation, community education, and professional responsibility.

The curriculum is divided into three categories of courses: foundation courses, core requirements, and electives. Students transferring from another college may be eligible to receive credit for one or more equivalent foundation courses already completed. Students who receive transfer credit for foundation courses must still complete the total course credits required in Addictions Counseling Sciences, and may do so by selecting elective courses to take along with the required core courses.

First Year Suggested Sequence

Fall		Credits
ADCS 312	**Introduction to Addictive Disorders**	3
ADCS 332	**Psychopharmacology for Counselors**	3
ADCS 342	**Foundations of Behavioral Health Care**	3
MHSC 360	**Behavioral Disorders**	3
	Elective	3

Spring		Credits
ADCS 322	**Theory and Practice of Counseling**	3
ADCS 364	**Life-Span Human Development**	3
ADCS 365	**Assessment and Treatment Planning**	3
MHSC 344	**Multicultural Counseling Perspectives**	3
	Elective	3

Second Year Suggested Sequence

Fall		Credits
ADCS 362	**Ethics and Professional Responsibility**	3
ADCS 402	**Cognitive-Behavioral Counseling**	3
ADCS 410	**Group Counseling**	3

ADCS 412	**Case Management Methods**	3
	Elective	3

Spring		**Credits**
ADCS 404	**Cognitive-Behavioral Counseling II**	3
ADCS 408	**Recovery and Relapse Prevention Methods**	3
ADCS 411	**Group Counseling II**	3
ADCS 440	**Senior Practicum**	3
	Elective	3
	Program credits	60

Behavioral Counseling Sciences

Bachelor of Science Degree: 121 credits

The Behavioral Counseling Sciences program presents a competency-based curriculum designed to meet the changing needs of the behavioral health care work force. Behavioral health counselors perform a variety of tasks, including case management, psychiatric rehabilitation, family support services, residential treatment, individual and group counseling, and crisis intervention. This unique preprofessional, clinical program prepares students with the essential values, attitudes, knowledge, and skills required to become leaders in meeting new challenges in community-based behavioral health care programs throughout the United States.

Curriculum

Behavioral Counseling Sciences is a two-year program for junior-year entry-level students leading to a bachelor of science (B.S.) degree. The first year generally provides theoretical foundations for professional practice in behavioral health care settings. The second year integrates a three-day-per-week clinical training experience with courses that continue guiding students toward increased competencies as behavioral health counselors.

The curriculum is divided into three categories of courses: foundation courses, core requirements, and electives. Students transferring from another college may be eligible to receive credit for one or more equivalent foundation courses already completed. Students who receive transfer credit for foundation courses must still complete the total course credits required in Behavioral Counseling Sciences, and may do so by selecting elective courses to take along with the required core courses.

Although previous coursework in mental health or experience in the workplace is not necessary, the program is an ideal stepping-stone for students who are pursuing or have pursued an associate of science degree in mental health or human services.

First Year Suggested Sequence

Fall		Credits
MHSC 336	**Theory and Practice of Counseling**	3
MHSC 352	**Life-Span Human Development**	3
MHSC 358	**Foundations of Behavioral Health Care**	3
MHSC 360	**Behavioral Disorders**	3
	Elective	3

Spring		
MHSC 301	**Psychiatric Rehabilitation Principles**	3
MHSC 333	**Group Counseling**	3
MHSC 344	**Multicultural Counseling Perspectives**	3
MHSC 363	**Crisis and Brief Intervention Counseling**	3
MHSC 371	**Ethics and Professional Responsibility**	3

Second Year Suggested Sequence

Fall	Credits	
MHSC 337	**Family-Focused Interventions**	3
MHSC 351	**Cognitive-Behavioral Counseling**	3
MHSC 355	**Clinical Case Seminar I**	2
MHSC 395	**Clinical Training I**	9

Spring		
MHSC 356	**Clinical Case Seminar II**	2
MHSC 396	**Clinical Training II**	9
	Elective	3

	Program credits	61

Biomedical Sciences

Associate of Science Degree: 60 credits
Bachelor of Science Degree: 120 credits
Bachelor of Science Degree, Honors: 132 credits

The Biomedical Sciences programs offer science-based curricula for those wishing to major in the natural sciences for employment purposes or for entrance into applicable undergraduate, graduate, or professional programs or schools related to health care. Although the programs emphasize the biomedical sciences, they seek to integrate scientific knowledge with the perspectives of the humanities and social sciences to provide students with a comprehensive background necessary for responding to the rapidly changing demands of today's health care delivery system. An honors program has been designed for qualified individuals with strong backgrounds in the natural sciences and mathematics and with interests in careers in medicine, optometry, podiatry, dentistry, pharmacy, or physical therapy.

Associate Degree Program Curriculum
The associate degree program is a two-year, full-time course of study that leads to an Associate of Science (A.S.) degree. Individuals wishing to attend part time or to transfer may also apply.

The program, which requires the completion of 60 approved semester credits, is designed for the following individuals:

- *Those interested in the natural sciences, yet undecided about their career goals*
- *Those needing science-based associate degrees for employment purposes, primarily in health sciences or health care settings*
- *Those needing preparation for entrance into their desired undergraduate health professions programs*

The program has established agreements for enhancing consideration for admission to Drexel University's Physician Assistant program and Biomedical Sciences honors program. (For details, contact the University Office of Enrollment Management.)

Course		Credits
MATH 102	**College Mathematics (or higher)**	
or		
STAT 343	**Statistics**	3
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
CMPS 125	**Computer Applications**	3
	Humanities electives*	9
	Natural science electives**	20
	Social science electives***	9
	Open electives	10

See Electives for more information.

Bachelor's Degree Program Curriculum

The bachelor's degree program is a four-year, full-time course of study concentrating in the natural sciences and leading to a Bachelor of Science (B.S.) degree. Individuals interested in attending part time or transferring may also apply.

The program provides flexible curricula designed for the following individuals:

- *Those wishing to become physicians, physician assistants, optometrists, podiatrists, dentists, pharmacists, or physical therapists*
- *Those wishing to enter graduate school in various natural sciences disciplines*
- *Those needing science-based bachelor's degrees for employment purposes, primarily in health sciences or health care settings*

The program has established agreements for enhancing consideration for admission to Drexel University's Physician Assistant program and Biomedical Sciences honors program. (For details, contact the Office of Enrollment Management.)

Course		Credits
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
CMPS 125	**Computer Applications**	3
	College Mathematics (or higher; may include Statistics)	6
	Humanities electives*	18
	Natural science electives**	40
	Social science electives***	18
	General electives	29

See Electives for more information.

Honors Program Curriculum

The Biomedical Sciences honors program is a four-year, full-time intensive course of study requiring the successful completion of 132 approved semester hours leading to a Bachelor of Science (B.S.) degree. Individuals interested in transferring may also apply.

The program is designed for individuals with a strong background in the natural sciences and mathematics who have interest in extensive exposure to the biomedical sciences for entrance into professional schools and graduate programs for careers in medicine, dentistry, optometry, podiatry, pharmacy, and physical therapy.

For continued enrollment in the honors program, a student must maintain a cumulative GPA of 3.25. This program has established agreements with the Drexel University College of Medicine and the D.P.T. Program in Physical Therapy at Drexel. Through these agreements, a student who meets the specified criteria of the College of Medicine or the graduate Physical Therapy program and who successfully completes the bachelor's degree program is guaranteed acceptance. (For details, contact the University Office of Enrollment Management.)

Course	Credits

ANAT 130	**Anatomy and Physiology I**	4
ANAT 131	**Anatomy and Physiology II**	4
BIOL 201	**General Biology I**	3
BIOL 202	**General Biology II**	3
BIOL 210	**General Biology I Lab**	1
BIOL 211	**General Biology II Lab**	1
CHEM 201	**General Chemistry I**	3
CHEM 202	**General Chemistry II**	3
CHEM 203	**General Chemistry I Lab**	1
CHEM 204	**General Chemistry II Lab**	1
CHEM 315	**Organic Chemistry I**	4
CHEM 316	**Organic Chemistry II**	4
CHEM 317	**Organic Chemistry I Lab**	1
CHEM 318	**Organic Chemistry II Lab**	1
CMPS 125	**Computer Applications**	3
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
MATH 214	**Calculus I**	4
MATH 215	**Calculus II**	4
PHIL 107	**Ethics and Medicine**	3
PHIL 325	**Critical Thinking**	3
PHSC 325	**General Physics I (with lab)**	5
PHSC 326	**General Physics II (with lab)**	5
STAT 343	**Statistics for Physical Sciences**	3
	Humanities electives*	12
	Biomedical science electives**	16
	Social science electives***	18
	General electives	16

See Electives for more information.

Electives

** Humanities electives include approved courses in ethics, fine arts, folklore, languages, literature, music, mythology, philosophy, religion, speech, and theater. (Courses used to fulfill the composition and literature requirement will not count as humanities electives.)*

***Natural science and Biomedical science electives include approved courses in biology, chemistry, and physics and advanced anatomy, biochemistry, cell and molecular biology, cross-sectional anatomy, developmental anatomy, genetics, human physiology, medical microbiology, neurobiology, pathophysiology, and physiology.*

****Social science electives include approved courses in anthropology, archaeology, environmental studies, geography, history, political science, psychology, and sociology. With the approval of the program director, three semester hours of accounting, administration, business, economics, finance, law, management, or marketing may be used in place of a three-semester-hour social science elective for the bachelor's degree program.*

Special Services

Preprofessional Advisory Committee

Drexel University offers several supporting services for preprofessional students. The Preprofessional Advisory Committee assists students in applying to professional

schools or programs in areas such as medicine, dentistry, optometry, podiatry, pharmacy, physical therapy, physician assistant, and physical therapist assistant. Members of the Preprofessional Advisory Committee are always available to offer advice on course selection, professional schools' or programs' entrance requirements, and other matters relevant to pursuing these career goals.

Preprofessional Society

Students are encouraged to join the Preprofessional Society of Drexel University. The Society meets regularly as a forum for discussing career-related issues and to provide career-planning information to students interested in medicine and physical therapy.

Cardiovascular Perfusion Technology

Bachelor of Science Degree: 132 credits

This program gives students a thorough preparation for the relatively new and challenging occupation of cardiovascular perfusion. Perfusionists apply their knowledge of the cardiopulmonary system and complex technology to the task of maintaining life during cardiac surgery. They prepare and operate the heart-lung machine and other equipment that replaces normal heart and lung functions during surgery.

In addition to becoming knowledgeable about this equipment, students learn to interpret patients' medical histories and lab results, develop plans to conduct perfusion, implement the selection and interpretation of appropriate diagnostic tests, and learn to administer blood products and pharmacological agents. The perfusionist's role during cardiovascular bypass for elective heart surgery is highlighted, as are responsibilities in other clinical areas, including neurosurgery, organ and limb preservation, blood salvage and recovery, and transplantation.

Curriculum

The 21-month curriculum is designed for students who have already completed two or more years of college. Upon graduation, students are awarded the Bachelor of Science (B.S.) degree. The first semester is spent primarily in classroom instruction, while the remainder of the program focuses on clinical experience. Clinical rotation sites perform more than 2,000 cardiac surgeries annually, giving students the opportunity for a high volume of clinical work. More than half of the required semester hours are in clinical practica. The program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

First semester		**Credits**
CVPT 101	**Perfusion Technology I**	4
CVPT 289	**Cardiac Anatomy and Physiology**	4
CVPT 293	**Basic Surgery and Monitoring**	2
CVPT 320	**Physiologic Management of the Bypass**	3

Second semester		
CVPT 295	**Clinical Practicum I**	8
CVPT 310	**Perfusion Technology II**	4
CVPT 330	**Cardiovascular Pathology**	4
CVPT 340	**Cardiovascular Pharmacology**	3

Third semester		
CVPT 300	**Clinical Practicum II**	12

Fourth semester		
CVPT 305	**Pediatric Clinical Practicum**	2
CVPT 307	**Clinical Practicum III**	12

Fifth semester

CVPT 350	**Clinical Practicum IV**	12
CVPT 360	**Cardiac Surgical Practicum**	2
	Program credits	72

In addition, an independent research paper pertaining to cardiothoracic surgery is required. Examples of two recent projects are the management of diabetic patients undergoing open-heart surgery and experimental animal research with mechanical heart-assist devices.

Emergency Medical Services

Associate of Science Degree: 76 credits
Bachelor of Science Degree: 139 credits

The undergraduate Emergency Medical Services (EMS) program provides two educational tiers, giving students the option of following an associate or a bachelor's degree track. Throughout the program, students learn to provide competent clinical prehospital care to the ill or injured, to master skills and concepts essential to the coordination and management of EMS systems, and to interact effectively with other health care professionals and patients.

While laying the foundation for graduate-level endeavors, the program also prepares students to analyze important public-policy issues that confront both prehospital emergency medical services and the emerging network of EMS systems and to combine theoretical and practical experience and knowledge of health care as it applies to EMS.

Accredited by the Pennsylvania Department of Health, Drexel University's program complies with the Commonwealth of Pennsylvania's EMS guidelines. The paramedic curriculum exceeds the National Standard Curriculum as accepted by the National Highway Traffic Safety Administration in 1998.

Curricula
Each degree track offers a traditional option, in which EMTs complete all necessary paramedic certification and degree coursework at Drexel University, and a completion option, in which certified EMT-Ps and recognized prehospital RNs can challenge for clinical credits and complete remaining degree coursework at Drexel University. Many online courses are being developed to allow off-site completion of the program.

Each degree track offers both a full-time and part-time option. The part-time program is designed for the person who wants to obtain their associate's or bachelor's degree as well as their paramedic certification but cannot attend a traditional program because of lifestyle and scheduling conflicts.

The flexible part-time option allows students to take courses that combine distance education and live classroom interaction. Via computer, the student will access daily didactic information such as lectures, videos, and reading assignments; hold online discussions; and take quizzes. Courses with a clinical lab component will require the student to attend a weekend of intensive skill learning, practice, and testing once a month. Clinical and field rotations are conveniently scheduled throughout the program. It should be noted that certain courses are sequenced to enhance the learning experience of the student. For additional information about part-time options, please contact the department.

Traditional Program, Associate Degree
The traditional associate degree program prepares students to take the EMT-P certification examination. Clinical education is combined with investigation of specific EMS and health care management issues as well as a broad base of science and liberal arts courses. Five semesters of work are required to complete this degree. Clinical and field rotations are included throughout the two years. Although most students complete the clinical program on a full-time basis, a part-time process is being developed.

First Year

Fall Semester		Credits
ANAT 130	**Anatomy and Physiology I**	4
CMPS 125	**Introduction to Computer Applications**	3
EMS 104	**Disease Processes I**	2
EMS 105	**Pharmacology for the Prehospital Provider**	3
EMS 108	**Prehospital Field Techniques I**	1
EMS 210	**EMS Management I**	3
	College math	3

Spring Semester		Credits
ANAT 131	**Anatomy and Physiology II**	4
EMS 103	**Advanced Assessment**	3
EMS 107	**Disease Processes II**	2
EMS 109	**Prehospital Field Techniques II**	2
EMS 112	**Professional Issues in EMS**	1
EMS 301	**EMS Management II**	4
	Humanities elective	3

Second Year

Fall Semester		Credits
EMS 201	**Emergency Care Analysis and Intervention I**	5
EMS 202	**Emergency Care Analysis and Intervention Lab I**	4
EMS 205	**Instructional Issues in Emergency Health Services**	3
ENGL 101	**English Composition and Literature I**	3
	Social science elective	3

Spring		
EMS 125	**Field Practicum I**	3
EMS 203	**Emergency Care Analysis and Intervention II**	5
EMS 206	**Emergency Care Analysis and Intervention Lab II**	5
ENGL 102	**English Composition and Literature II**	3

Summer		
EMS 226	**Field Practicum II**	6

Traditional Program, Bachelor's Degree

Building on the first five semesters, the upper years concentrate on additional management, research, and administration knowledge with applied practica to enhance students' abilities. A required full-semester internship allows students to concentrate on an area of interest and specialization. Students can complete the B.S. degree as a continuous four-year sequence or on a part-time schedule for years three and four.

Internship examples include various regional EMS councils, flight programs, the

Federal Emergency Management Agency, OSHA, EMS operational systems, Delaware State Police, and hospital emergency departments.

A nonclinical option is available for those interested in EMS education, management, and administration. This option is directed toward those who have had previous experience in other aspects of EMS and want additional education specific to health care management. EMT certification is a prerequisite. Please contact the program director for further information.

First Year

	Same as associate degree program.

Second Year

	Same as associate degree program.

Third Year

Fall Semester		**Credits**
CMPS 305	**Management Applications of Computers**	3
EMS 305	**Utilization and Preparation of Instructional Materials**	3
EMS 306	**Concepts of Injury Prevention**	3
EMS 360	**Local, State, and Federal Legislation**	3
STA 343	**Statistics for the Physical Sciences**	3
	Social science elective	3

Spring Semester		
ECON 210	**Economics**	3
EMS 368	**Practical Safety Services Applications**	3
MGMT 310	**Issues and Problems in Health Care Delivery**	3
MGMT 315	**Accounting and Budgeting for Health Professionals**	3
	Humanities elective	3

Fourth Year

Fall Semester		**Credits**
EMS 307	**Critical Incident and Stress Management**	3
EMS 315	**Special Topics in EMS**	3
EMS 365	**Planning and Fiscal Approaches**	3
RSCH 349	**Research and Experimental Design**	3
	Social science elective	3

Spring Semester		
EMS 355	**Internship**	15

Completion Program, Associate Degree

The completion program for the associate degree allows paramedics, who have state or National Registry certification, and recognized prehospital RNs to show evidence of equivalent clinical coursework in order to receive credit for their previous clinical

certifications by way of an Advanced Life Support competency examination. These students then complete the remaining courses to receive the associate degree. The EMS core courses are specific to Drexel University and must be completed here. Transfer of the other courses is acceptable with a grade of C or higher.

Completion Program, Bachelor's Degree
The completion program allows certified paramedics or recognized prehospital RNs to show evidence of clinical competence through their current Advanced Life Support practice status and complete a competency examination to receive clinical course credits. Previous college credits are transferred as appropriate and required by each campus. Students then complete the EMS and required courses to meet University requirements. To complete the clinical courses, the challenge process will be used to obtain 30 credits when clinical competency is demonstrated.

Part-Time Option
The part-time option for the bachelor's degree completion program allows certified paramedics and prehospital RNs to obtain their degree either through traditional classroom interaction or distance learning. Students will receive up to 30 credits for their clinical experience through a challenge exam. These credits will be used to cover the clinical courses in the first two years. Previously earned college credits with a grade of C or higher that equate to courses at the college of Nursing and Health Professions will be considered for transfer. At least 50 percent of the credits must be completed through the University. Due to the uniqueness of the EMS core courses, students should plan on completing them at Drexel.

EMS Core Courses Offered:

EMS Management I

EMS Management II

Instructional Issues in Emergency Health Services

Concepts of Injury Prevention

Utilization and Preparation of Instructional Materials

Local, State, and Federal Legislation

Issues and Problems in Health Care Delivery

Practical Safety Services

Special Topics in EMS

Critical Incident and Stress Management

Planning and Fiscal Approaches

Research and Experimental Design

Internship

Prehospital RN Program
The Prehospital RN program is available for RNs interested in expanding their experience to the prehospital area. This two-semester program is conducted from January to August each year and follows Pennsylvania Department of Health guidelines. Clinical and field rotations are required. Prerequisites include a current Pennsylvania RN license and a current CPR card.

Admission Requirements

ENT-B certification is required. This certification provides a foundation for the development of more advanced EMS skills and knowledge. EMT courses are available in many settings, from community colleges to county EMS Office-sponsored training centers.

High school-level mathematics, English, and basic sciences will provide a foundation for college-level work. Weakness in any of these areas should be evaluated by the applicant and additional coursework completed if necessary. The curriculum is demanding so a solid start is essential. Applicants must forward to the Admissions Office:

- Official high school transcript(s) or GED records
- Previous college transcript(s) if applicable
- SAT or ACT scores unless they have earned 30 semester hours of college work with a grade of C or higher at the time of application
- EMT or paramedic certification if applying for the completion program or nonclinical option
- Current CPR course completion by the beginning of the first semester

Applicants for the clinical paramedic program must meet all Pennsylvania Department of Health requirements for criminal history clearance, age, and ability to complete the functional job description. The ability to sit for the state certification examination rests on successful course completion, validation by the program medical director of the student's knowledge and skills abilities, and clearance from the Office of EMS regarding the above factors.

The program may interview applicants as admissions files become complete. Admissions are on a continuous review basis; it is recommended that clinical students begin in the fall semester for appropriate course sequencing.

Health Education and Related Training (HEART) Program

The HEART Program is a two-year certificate program that introduces students to the variety of health-care careers and strengthens their basic skills. Students, depending upon their academic levels, can take college credit or non-college credit courses. Students who wish to enter the Home Health Aide option can be trained to be home-health aides as well as beginning their college careers.

Application Requirements

Students who apply for the HEART Program must have:

- a high school diploma or GED
- official copy of all high school transcript(s) and/or GED
- official copy of SAT or ACT scores
- official transcript(s) for any course taken at the post-secondary school level
- university application materials completed
- an interview with the HEART Program Director or designated faculty member

Curriculum

First year **Fall**		**Credits**
BIOL 092	**Fundamentals of Biology**	4
EDUC 095	**Life Skills**	0
EDUC 096	**SAT Preparation**	0
ENGL 097	**Fundamentals of English**	3
ENGL 098	**Fundamentals of Reading**	3
or		
NURS 93	**Home Health Care Clinical**	3
GENH 099	**Introduction to Health Sciences**	4
or		
NURS 92	**Home Health Care Basics**	3
MATH 094	**Fundamentals of Mathematics**	3

Spring		
CHEM 093	**Fundamentals of Chemistry**	4
CMPS 125	**Computer Applications**	3
ENGL 101	**Composition and Literature I**	3
HUMN 125	**Medical Terminology**	3
or		
SPCH 213	**Public Speaking**	3
MATH 102	**College Mathematics**	3

Second year **Fall**		

BIOL 201	**General Biology I**	3
BIOL 210	**General Biology I Lab**	1
ENGL 102	**Composition and Literature II**	3
PHIL 107	**Ethics and Medicine**	3
MGNT 101	**Management**	3
PSYC 101	**Introduction to Psychology**	3

Spring

BIOL 202	**General Biology II**	3
BIOL 211	**General Biology II Lab**	1
PSYC 319	**Life-Span Human Development**	3
SOC 115	**Introduction to Sociology**	3
HUMN 125	**Medical Terminology**	3
or		
SPCH 213	**Public Speaking**	3
or		
PHIL 311	**Values and Health Profession**	3
or		
HUMN 314	**Medicine and the Arts**	3
PSYC 200	**Behavioral Disorders**	3

Home Health Aides

The Home Health Aide works as part of a team in caring for clients in their homes. The Home Health Aide provides direct care to a client such as bathing, preparing meals, feeding, assisting with an exercise program, obtaining items from the store, cleaning and doing laundry. The Home Health Aide also teaches or reinforces teaching during his/her daily activities with the client and his/her family members. The Home Health Aide is also a team member who interacts with nurses, physicians and community agencies to secure the best resources for the client and family.

It is projected that the need for Home Health Aides will continue to increase by 74.5 % in 2008 as the number of elderly increases, the length of hospital stays continually decreases, and the amount of in-home medical technology increases.

After one semester of training and passing a certification exam, the student would be able to work as a Home Health Aide while continuing his/her college education.

For More Information: contact Diana Williams, Director, HEART Program, MS 526, Drexel University, Center City Hahnemann Campus 245 N. 15th Street, Philadelphia, PA 19102-1192 or call (215) 762-7682 or E-mail: dw32@drexel.edu

Humanities and Social Sciences

These programs consist of the following majors:

Health Sciences and General Studies
Associate of Science Degree: 60 credits
Bachelor of Arts Degree: 120 credits

Health-Services Administration
Associate of Science Degree: 60 credits
Bachelor of Science Degree 120 credits

Humanities and Social Sciences
Associate in Arts Degree: 60 credits
Bachelor of Arts Degree 120 credits

The Humanities and Sciences programs at Drexel University serve individuals seeking broad-based or health administration–based associate and bachelor's degrees to increase employment opportunities or enhance current positions or to prepare for applicable junior-year–entry programs at the University or for graduate study in various areas of administration or other appropriate areas of study.

Associate Degree Program (A.A. or A.S.)
Drexel University offers a two-year, full-time course of study (a part-time option is also available) leading either to an Associate in Arts degree with a concentration in humanities and social sciences or to an Associate of Science degree with a concentration in health sciences and general studies or a concentration in health-services administration. Each of these concentrations requires the completion of 60 approved semester hours and is intended for the following individuals:

- *Those seeking broad-based or health administration–based associate degrees for employment purposes*
- *Those needing liberal arts preparation for entrance into such junior-year–entry programs as the University's Behavioral Counseling Sciences bachelor's degree program and the Addictions Counseling Sciences bachelor's program*
- *Those who are uncertain about their concentrations yet wish to be in a health-sciences environment and are interested in later applying to one of the College's health-sciences programs or to the Health-Services Administration bachelor's degree program*

Individuals interested in transferring from other accredited institutions may also apply to the associate degree program. (Those not seeking the associate degree, but wishing to pursue the bachelor's degree at the first-year level or higher, need to apply to the bachelor's degree program.)

Bachelor's Degree Program (B.A. or B.S.)
Drexel University offers a four-year, full-time course of study (a part-time option is also available) leading either to a Bachelor of Arts degree with a concentration in humanities or social sciences or a combined concentration in humanities and social

sciences or to a Bachelor of Science degree with a concentration in health sciences and general studies or a concentration in health-services administration. (Individuals may enter the program at the first-year level or higher, depending on the number of transferable semester credits.) Each of these programs requires the completion of 120 approved semester credits and is intended for the following individuals:

- *Those seeking bachelor's degrees with flexible, broad-based curricula, yet wishing to concentration in humanities, social sciences, or health-services administration for employment purposes or for entrance into graduate schools or programs in areas such as psychology, family therapy, law, academic or business or health services administration, and—for those formally trained in music, art, or dance—the University's Creative Arts in Therapy program*
- *Those having concentrations in any area of the health sciences and seeking the Bachelor of Science degree through a broad-based general-studies baccalaureate-completion curriculum*

Associate Degree Curricula
Distribution requirements for the associate degree can include up to 30 approved transfer semester credits.

Humanities electives include approved courses in communications, ethics, fine arts, folklore, languages, literature, music, mythology, philosophy, religion, speech, and theater. (Courses used to fulfill the Composition and Literature I and II requirements will not count as humanities electives.)

Social science electives include approved courses in anthropology, archaeology, economics (introductory), environmental studies, geography, history, management (introductory), political science, psychology, and sociology. With the approval of the program director, three semester hours of accounting, administration, business, economics (upper level), finance, law, management (upper level), or marketing may be used in place of a three-semester-hour social science elective for the bachelor's degree.

Natural sciences electives include approved courses in anatomy, astronomy, biochemistry, biology, botany, chemistry, genetics, geology, meteorology, microbiology, neurobiology, oceanography, pathophysiology, physics, physiology, zoology, and other approved natural sciences.

Health sciences electives include approved courses in cardiovascular perfusion technology, clinical laboratory sciences, medical coding, nursing, physician assistant, radiologic technology, respiratory therapy, and other approved health sciences.

Humanities and Social Sciences Concentration (A.A.)

Course		Credits
CMPS 125	**Computer Applications**	3
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
MATH 102	**College Mathematics (or higher)**	
or		

STAT 343/344	**Statistics**	3
	Humanities electives	15
	Natural science elective	3
	Social science electives	15
	General electives (under advisement)	15

Health Sciences and General Studies Concentration (A.S.)

Course		Credits
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
	Natural science elective	3
	Humanities/social science electives	6
	Health sciences electives (can include natural sciences)	15
	General electives (under advisement)	30

Health-Services Administration Concentration (A.S.)

Course		Credits
CMPS 125	**Computer Applications**	3
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
MATH 102	**College Mathematics (or higher)**	3
	Health services administration electives	15
	Humanities electives	12
	Natural science elective	3
	Social science electives	12
	General electives (under advisement)	6

Courses offered in health-services administration include Accounting and Budgeting for Health Professionals, Economics, Financial Management for Health Professionals, Health-Care Law, Health-Care Policy, Health-Systems Administration, Issues and Problems in the Health-Care-Delivery System, Leadership and Management, Management, Management Applications for Microcomputers, Health-Care Marketing, and Readings in Health-Systems Administration.

Bachelor's Degree Curricula

Distribution requirements for the bachelor's degree can include up to 60 approved transfer semester credits or, when applicable, up to 105 prior in-house (Drexel University) semester credits or a combination of approved transfer semester credits and applicable prior in-house semester credits totaling no more than 105 semester credits. In each of these cases, a student pursuing the bachelor's degree must earn at least 60 approved semester credits from Drexel University. In addition, a minimum of 15 approved semester credits must be earned from courses taken at Drexel during the student's enrollment in the Humanities and Sciences bachelor's degree program.

Humanities electives include approved courses in communications, ethics, fine arts,

folklore, languages, literature, music, mythology, philosophy, religion, speech, and theater. (Courses used to fulfill the Composition and Literature I and II requirements will not count as humanities electives.)

Social science electives include approved courses in anthropology, archaeology, economics (introductory), environmental studies, geography, history, management (introductory), political science, psychology, and sociology. With the approval of the program director, three semester hours of accounting, administration, business, economics (upper level), finance, law, management (upper level), or marketing may be used in place of a three-semester-hour social science elective.

Natural sciences electives include approved courses in anatomy, astronomy, biochemistry, biology, botany, chemistry, genetics, geology, meteorology, microbiology, neurobiology, oceanography, pathophysiology, physics, physiology, zoology, and other approved natural sciences.

Health sciences electives include approved courses in cardiovascular perfusion technology, clinical laboratory sciences, medical coding, nursing, physician assistant, radiologic technology, respiratory therapy, and other approved health sciences.

Humanities Concentration (B.A.)

Course		Credits
CMPS 125	**Computer Applications**	3
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
MATH 102	**College Mathematics (or higher)**	
or		
STAT 343/344	**Statistics**	3
	Humanities electives	30
	Natural science electives	6
	Social science electives	18
	General electives (under advisement)	54

Social Sciences Concentration (B.A.)

Course		Credits
CMPS 125	**Computer Applications**	3
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
MATH 102	**College Mathematics (or higher)**	
or		
STAT 343/344	**Statistics**	3
	Natural science electives	6
	Humanities electives	18

	Social science electives	30
	General electives (under advisement)	54

Humanities and Social Sciences Concentration (B.A.)

Course		Credits
CMPS 125	**Computer Applications**	3
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
MATH 102	**College Mathematics (or higher)**	
or		
STAT 343/344	**Statistics**	3
	Humanities electives	30
	Natural science electives	6
	Social science electives	30
	General electives (under advisement)	42

Health Sciences and General Studies Concentration (B.S.)

Course		Credits
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
	Computer studies or communications elective	3
	Health sciences electives (can includenatural sciences)	30
MATH 102	**College Mathematics (or higher)**	
or		
STAT 343/344	**Statistics**	3
	Humanities/social science electives	18
	Natural science electives	6
	General electives (under advisement)	54

Health-Services Administration Concentration (B.S.)

Course		Credits
CMPS 125	**Computer Applications**	3
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
MATH 102	**College Mathematics (or higher)**	3
STAT 343/344	**Statistics**	3
	Humanities electives	18

Natural science electives	6
Social science electives	18
Health-services administration electives (must include Management Applications for Microcomputers)	30
General electives (under advisement)	33

Courses offered in health-services administration include Accounting and Budgeting for Health Professionals, Economics, Financial Management for Health Professionals, Health-Care Law, Health-Care Policy, Health-Systems Administration, Issues and Problems in the Health-Care-Delivery System, Leadership and Management, Management, Management Applications for Microcomputers, Health-Care Marketing, and Readings in Health-Systems Administration.

Bachelor's degree health-services administration electives can include the following interdisciplinary courses: Ethics and Medicine; The Elderly in Today's World; A Global History of Health Care; Health-Care Team; Health, Disease and Healing from a Cross-Cultural Perspective; Religious Perspectives on Health-Care Practices; Social History of Health Care in America; Sociology of Aging; Values and the Health Professions; Women and the Health Professions.

Nursing

Bachelor of Science in Nursing Co-op Program: 181 credits
ACE B.S.N. Option
R.N./B.S.N. Completion Program: 121 credits
R.N./B.S.N./M.S.N. Program: varies by program choice

Accreditation

All undergraduate nursing programs are accredited by the Pennsylvania State Board of Nursing; the National League for Nursing Accreditation Commission, 61 Broadway, New York, NY 10006; 212-363-5555; and the American Association of Colleges of Nursing, One Dupont Circle, NW, Suite 530, Washington, DC 20036.

Nursing Program at Drexel

This program allows you to begin your nursing studies during your first year at Drexel University. You then take your nursing courses at the Center City Hahnemann Campus while taking support courses at the University City Main Campus. Students graduate with a Bachelor of Science in Nursing and eligibility to sit for the R.N. licensure examination.

The B.S.N. at Drexel

Drexel's nursing curriculum is built to respond to the rapidly changing health care system, as well as to your needs. As a graduate of the baccalaureate program, you will be prepared to:

- *Use the growing compendium of current knowledge and information sources from nursing and other disciplines to learn, to teach, to heal the sick, and to preserve health*
- *Contribute to the profession by sharing knowledge and skills with clients, peers, and other professionals in a variety of methods*
- *Use multiple technologies to access and manage information to guide professional practice*
- *Participate in culturally sensitive health promotion activities that contribute to the health and wellness of the community*
- *Participate in ongoing educational activities related to personal growth, professional practice, and community service*
- *Apply knowledge and skills appropriate to the selected area of career clinical practice*
- *Develop personal potential for leadership in a changing health care environment*
- *Integrate ethical concepts and principles, the Nurses Code of Ethics, and professional standards into practice within professional, academic, and community settings*
- *Use critical thinking skills to improve the health outcomes of patients, families, and communities across the continuum of care*

A B.S.N. is awarded at the completion of the program. Qualified students (those with strong clinical skills and a minimum GPA of 3.0) are encouraged to submatriculate in the M.S.N. program while enrolled in the B.S.N. program. (See page 86 for details.) These students may take five master's-level courses in lieu of the senior project and free electives.

B.S.N. Co-op Program

Co-operative education was designed to provide students with real-world experience in a variety of professional settings before graduation. Co-op integrates full-time work experience in your field of study throughout the academic program. The College of Nursing and Health Professions co-op program is one of only two of its kind in the nation.

The nursing co-op provides you with 18 months of co-operative education in addition to the traditional clinical educational experiences.

Through co-op you'll get the opportunity to learn the role of the nurse and unlicensed assistive personnel as well as other daily professional, political, and social issues in a work environment. Both before and during your co-op experience you will receive instruction on career management and professional development skills, such as résumé writing, job searches, interviewing skills, maintaining a career portfolio, negotiating salary, and professional. The clinical background you gain from your co-op experience, coupled with a knowledge of career management, makes the Drexel option a value-added model of nursing education.

B.S.N. Co-op Program Curriculum

Below are the nursing course requirements, listed by year and term. The curriculum sequence also indicates how co-op experiences are integrated.

First Year

Fall		Credits
CHEM 101	**General Chemistry I**	4
HUM 101	**Composition**	3
NURS 100	**Nursing in Society**	4
PSY 101	**General Psychology**	3
UNIV 101	**Drexel Experience**	2

Winter

ANAT 101	**Anatomy and Physiology I**	5
CHEM 102	**General Chemistry II**	4
CS 161	**Introduction to Computing**	3
HUM 102	**Reading and Research**	3
UNIV 101	**Drexel Experience**	2

Spring

ANAT 102	**Anatomy and Physiology II**	5
BIO 221	**Microbiology**	5
HUM 103	**Techniques of Analysis and Evaluation**	3
NURS 102	**Health Promotion, Health Teaching, and Self Care**	4

Second Year

Fall and Winter		Credits
Co-op I	**Nursing in the Global Health Network (24 co-op units)**	

Spring

ANAT 103	**Anatomy and Physiology III**	5
NFS 200	**Nutrition I: Principles of Nutrition**	4
NURS 200	**Principles of Nursing Practice**	4
NURS 201	**Health Assessment Across the Life Span**	4

Summer

NFS 203	**Nutrition II: Nutrition in the Life Cycle**	4
NURS 300	**Comprehensive Adult Nursing I**	6
NURS 301	**Pharmacology for Nursing I**	3
PSY 120	**Developmental Psychology**	3

Third Year

Fall and Winter		Credits
Co-op II	**Acute and Chronic Adult Health and Illness (24 co-op units)**	

Spring

NURS 303	**Women's Health Nursing**	6
NURS 308	**Mental Health Nursing**	6
SOC 101	**Introduction to Sociology**	3

Summer

NURS 304	**Nursing of Children**	6
NURS 305	**Comprehensive Adult Nursing II**	6
NURS 306	**Pharmacology for Nursing II**	3

Fourth Year

Fall and Winter		Credits
Co-op III	**Specialty Nursing Concentration (24 co-op units)**	

Spring

NURS 400	**Leadership, Management, and Entrepreneurship in Nursing**	4

NURS 403	**Community/Public Health Nursing**	6
STAT 201	**Statistics I**	4
	Free elective	3

Summer

NURS 404	**Nursing Informatics**	3
PHIL 251	**Ethics**	
or		
PHIL 321	**Biomedical Ethics**	3
	Social science elective	3
	Free elective	3

Fifth Year

Fall		**Credits**
ECON 390	**Health Economics**	3
NURS 330	**Research Basis of Nursing**	3
NURS 401	**Comprehensive Adult Nursing III**	6
SOC 125	**Sociology of Aging**	3

Winter

NURS 450	**Contemporary Gerontological Nursing**	6
NURS 490	**Senior Project in Nursing I**	3
	Humanities elective	3

Spring

NURS 336	**Alternative and Complementary Health Interventions**	3
NURS 491	**Senior Project in Nursing II**	3
NURS 492	**Senior Seminar in Nursing**	3
	Free elective	3
	Total co-op units	72

Accelerated Career Entry (ACE) B.S.N. Option

Drexel University now offers the Accelerated Career Entry Option, a one-year intensive nursing program for students who already have bachelor's or graduate degrees. The program is ideal for working adults or college graduates who want to change careers and earn a new degree in one year. This innovative program is geared to students who will benefit from intense education in nursing science rather than the traditional program, which takes three or four years.

Admission Requirements and Prerequisites

Candidates for admission must be college graduates with a 2.75 overall GPA or a 3.0 GPA in their most-recent 60 hours of coursework completed. Admitted students must complete all prerequisites before continuing with the program.

Prerequisites

Subject	Completed Credits
English	6
Sociology	3
Psychology	3
Developmental Psychology	3
Ethics	3
Nutrition	3
Chemistry	4
Microbiology*	4
Anatomy*	4
Physiology*	4
Communications elective (Computer Science, Public Speaking)**	3
Statistics	3

***Anatomy, Physiology, and Microbiology courses must have been taken no more than five years before beginning the program.**

****Students with limited computer experience are strongly encouraged to complete an introductory computer course.**

Students take the same curriculum as in a traditional nursing program, but in a condensed form. This is the course schedule for the year:

Fall		Credits
NURS 100	**Nursing in Society**	4
NURS 102	**Health Promotion, Health Teaching, and Self-Care**	4
NURS 200	**Principles of Nursing Practice**	4
NURS 201	**Health Assessment Across the Life Span**	4
NURS 330	**Research Basis of Nursing**	3
NURS 336	**Alternative and Complementary Health Interventions**	3

Winter		
NURS 300	**Comprehensive Adult Nursing I**	6
NURS 301	**Pharmacology for Nursing I**	3
NURS 303	**Women's Health Nursing**	6
NURS 308	**Mental Health Nursing**	6

Spring		
NURS 304	**Nursing of Children**	6
NURS 305	**Comprehensive Adult Nursing II**	6

NURS 306	**Pharmacology for Nursing II**	3
NURS 403	**Community/Public Health Nursing**	6

Summer

NURS 400	**Leadership, Management, and Entrepreneurship in Nursing**	4
NURS 401	**Comprehensive Adult Nursing III**	6
NURS 404	**Nursing Informatics**	3
NURS 450	**Contemporary Gerontological Nursing**	6
NURS 492	**Senior Seminar in Nursing**	3

R.N./B.S.N. Completion Program

The Bachelor of Science in Nursing program continues the education of registered nurses to prepare them for the rapidly changing health care environment. Core courses prepare the graduate for population-based cases and the managed care environment. Support courses, electives, and study in an area of the student's choosing build on foundational educational experiences to facilitate the examination of critical issues from a variety of perspectives.

A B.S.N. is awarded at the completion of the program. Qualified students are encouraged to submatriculate in the M.S.N. program (R.N./B.S.N./M.S.N. option) while enrolled in the B.S.N. program. Students may take 3 to 15 M.S.N. credits in lieu of the nursing concentration and/or up to three electives.

R.N./B.S.N. Online Program

Getting a B.S.N. degree is now possible online. There are no residency requirements; clinical experiences are arranged in concert with you based on your interest, location, and schedule. With the knowledge and clinical skills gained from the R.N./B.S.N. Online program, you will have the opportunity to learn multiple technologies to access and manage information.

R.N./B.S.N./M.S.N. Program

The R.N./B.S.N./M.S.N. program is an accelerated program designed for graduates of associate-degree and diploma nursing programs who are committed to earning the Master of Science in Nursing degree. New students should complete the application process for the R.N./B.S.N. completion program. After completing a minimum of three baccalaureate nursing courses, students may apply to the M.S.N. program of their choice via an internal process. (Note: This completion option is not available in the women's care practitioner track.)

Currently enrolled students may apply to the program after completing three nursing courses. Although the graduate application form must be completed, the application fee is waived. Admission requirements are the same as for the M.S.N. program (see fact sheet for graduate programs). The GRE or MAT requirement is waived for students accepted to the nurse practitioner tracks of the R.N./B.S.N./M.S.N. program, but the exam must be taken by nurse anesthesia applicants.

After being accepted, students complete the remaining baccalaureate-level nursing and non-nursing courses. Accepted students may choose to substitute graduate nursing courses for 3 to 15 credits of their undergraduate courses. These substitutions may be made for the Nursing Concentration (NURS 44x) and/or up to three open electives.

If, after completing two or more M.S.N. courses, a student decides not to finish the program, the University awards the B.S.N., provided that the student has completed the required 121 credits. All students who have applied to and entered the R.N./B.S.N./M.S.N. program work closely with the academic advisor to ensure proper progression.

R.N./B.S.N. Completion Program Curriculum

The College of Nursing and Health Professions faculty uses a variety of teaching and learning methods to facilitate the achievement of a student's personal objectives. Most courses incorporate e-mail and Internet assignments as well as a variety of innovative, active learning assignments. Courses are offered in day and evening sessions in several stimulating educational formats.

In addition, courses are offered over the Web. Students can complete class work at home with just a few scheduled live chats. This is a popular option for busy professionals.

Course sequences are scheduled to allow full-time students to complete the nursing component of the program in three semesters. Students may also complete the program on a part-time basis. Admission can occur in any term.

First Tier

Course		Credits
ANAT 130	**Anatomy**	4
ANAT 131	**Physiology**	4
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
HUMN 050	**Humanities**	3
MICRO 108/109	**Microbiology**	4
NURS 050	**Nursing (by transfer validation)**	30
PSY 101	**General Psychology**	3
PSY 319	**Growth and Development**	3
SOC 115	**Introduction to Sociology**	3

Second Tier

Course		Credits
ECON 310	**Economics**	3
PHIL 311	**Ethics**	3
STAT 343	**Statistics**	3
	Communications elective* (Computer Science Applications, Public Speaking)	3

	Social science elective	3
	Science elective	3
	Advanced Physiology, Pharmacology, or Pathophysiology	3
	Electives	9

***Students with limited computer experience are strongly encouraged to complete an introductory computer course.**

Upper-Division Courses

Course		Credits
NURS 302	**Health Promotion and Disease Prevention**	4
NURS 322	**Health Assessment**	4
NURS 330	**Research Basis of Nursing**	3
NURS 334	**Nursing in Environments of Change**	4
NURS 336	**Alternative and Complementary Health Interventions**	3
NURS 402	**Public Health Nursing**	6
NURS 44X	**Nursing Concentration**	7

Radiologic Technology

Certificate Program: 91 credits
Associate of Science Degree Option: 15 credits
Post-Certificate Associate of Science Degree: 15 credits

Radiology is the branch of medicine that uses various forms of radiation, such as X-rays, to provide information for the prevention, diagnosis, and treatment of disease. Radiologic technologists aid physicians by performing radiologic examinations necessary to diagnose conditions and treat patients.

Certificate Program

The certificate program is a two-year program (summers included) that features an integrated plan of classroom work and closely supervised clinical practica. In addition to becoming familiar with all areas of diagnostic radiologic technology and the most modern, sophisticated equipment, students have clinical experiences in CT, magnetic resonance imaging, angiography, radiation therapy, and nuclear medicine. On successfully completing the program, graduates are eligible to take the certification examination offered by the American Registry of Radiologic Technologists.

First Year

Fall		Credits
ANAT 130	**Fundamentals of Human Anatomy**	4
RADI 100	**Introduction to Radiologic Technology**	2
RADI 141	**Radiographic Processing Technique**	1
RADI 150	**Principles of Radiographic Exposure I**	2
RADI 164	**Radiographic Procedures I**	3
RADI 194	**Methods of Patient Care**	2
RADI 195	**Clinical Practicum I**	3

Spring

ANAT 131	**Fundamentals of Human Physiology**	4
ANAT 302	**Cross-Sectional Anatomy**	2
RADI 132	**Radiologic Physics I**	2
RADI 153	**Principles of Radiographic Exposure II**	3
RADI 165	**Radiographic Procedures II**	3
RADI 196	**Clinical Practicum II**	3

Summer

RADI 197	**Clinical Practicum III**	12

Second Year

Fall		Credits
RADI 133	**Radiologic Physics II**	2
RADI 166	**Radiographic Procedures III**	3
RADI 201	**Medical Imaging**	2

RADI 222	**Pathology**	2
RADI 254	**Principles of Radiographic Exposure III**	1
RADI 291	**Clinical Practicum IV**	6

Spring

CMPS 125	**Computer Applications**	3
RADI 204	**Principles of Radiation Protection**	2
RADI 210	**Radiographic Procedures IV**	2
RADI 215	**Radiation Biology**	2
RADI 221	**Quality Assurance**	2
RADI 292	**Clinical Practicum V**	6

Summer

RADI 293	**Clinical Practicum VI**	12

Associate Degree Option

Student can pursue an Associate of Science degree while they are enrolled in the certificate program. They take five additional courses, totaling 15 credits, as shown in the table:

Courses needed		Credits
ENGL 101	**Composition and Literature I**	3
ENGL 102	**Composition and Literature II**	3
	Humanities elective	3
	Social science electives	6

Post-Certificate Associate Degree

Graduate technologists can pursue an Associate of Science degree. Continuing education is required for technologists who plan to move upward in the field of diagnostic imaging. Students may attend the program on a full-time or part-time basis and must complete 15 semester hours at Drexel University. They take the five courses listed in the table immediately above.

The School of Biomedical Engineering, Science, and Health Systems

The School of Biomedical Engineering, Science, and Health Systems (formerly the Biomedical Engineering and Science Institute, founded in 1961) is a nationally recognized center for research in biomedical engineering and science offering multidisciplinary instruction on a full- and part-time basis at the graduate and undergraduate levels.

The School of Biomedical Engineering, Science, and Health Systems offers two undergraduate Bachelor of Science degree programs:

- Biomedical Engineering
- Health Systems and Technology

Because of the interdisciplinary nature of both programs, personalized faculty advising is stressed. In both programs, students work closely with faculty advisors to select core and elective courses offered by the School of Biomedical Engineering, Science, and Health Systems as well as other academic units of the University, including the College of Engineering; the College of Arts and Sciences; the LeBow College of Business; the College of Information Systems and Technology; and the School of Environmental Science, Engineering, and Policy.

The School is the beneficiary of a major endowment that sponsors chair professorships and assistantships. Areas of strength in research and education include biosensors, biomedical ultrasound, biomedical imaging, biomedical systems and signal processing, biomechanics, biomaterials, tissue and cellular engineering, neuroengineering, human performance, and cardiovascular systems. New academic initiatives focus on biomedical optics and bioinformatics and computational biomedicine.

The faculty includes individuals with specialties in engineering, physics, mathematics, biostatistics, life science, medicine, and clinical work. Of the 93 associated full-time Drexel faculty members, 20 are core faculty members and 73 have joint appointments. Some 52 adjunct faculty members from regional institutions and industry participate in research and academic programs of the School.

Metropolitan Philadelphia has one of the highest concentrations of medical institutions and pharmaceutical, biotechnology, and medical devices and systems industries in the nation. In 2002, Drexel University merged with MCP Hahnemann University, which includes the MCP Hahnemann School of Medicine—one of the nation's largest medical schools. The School has also formed an academic alliance with Thomas Jefferson University, another prominent medical university, and has entered into a joint initiative in bioinformatics with the Coriell Institute for Medical Research and the Windber Research Institute. These initiatives ensure that students will have ample opportunities in basic research and clinical experience as well as innovative new academic programs.

Co-operative education and career opportunities available to students include employment in the medical device, equipment, and systems industry; the biomaterial

and implant industry; the pharmaceutical industry; the biotechnology and agricultural industry; the telemedicine and tele-health industry; health care; medical and clinical information and management systems; and biomedical technology transfer. Preprofessional options available in the academic programs of the School prepare students for admission to schools of medicine, dentistry, and veterinary medicine. Students may also choose to continue their education at the graduate level to prepare for careers in research and development in biomedical engineering and science.

Program Description
Biomedical engineering is concerned with the application of engineering and science methodologies to the analysis and solution of biological and physiological problems and to the delivery of health care. The biomedical engineer requires

the analytical tools and broad physical and mathematical knowledge of modern engineering and science, a fundamental understanding of the biological or physiological system, and familiarity with recent technological breakthroughs. The biomedical engineer connects traditional engineering disciplines with living systems and may work in either direction, applying the patterns of living organisms to engineering design or engineering new approaches to human health. Thus on the one hand, the biomedical engineer may use his or her knowledge of physiological systems to develop artificial tissues or neural networks. On the other hand, he or she may use engineering know-how to create new equipment or environments for such purposes as maximizing human performance, accelerating wound healing, or providing noninvasive diagnostic tools.

The School of Biomedical Engineering, Science, and Health Systems, in collaboration with the College of Engineering, offers a unique B.S. degree program in biomedical engineering. This program differentiates itself from those offered at other institutions in several ways, including an emphasis on a fundamental and comprehensive education in the principles and methods of engineering, case-study and interdisciplinary courses, professional electives, a capstone design project, and several terms of employment in industry, in clinics or medical research laboratories (co-op program).

Degree Requirements
The Bachelor of Science degree in biomedical engineering was inaugurated in the 1998–99 academic year. A minimum of 194 credits of academic work is required to complete the degree. Engineering students must maintain an overall grade point average of 2.0 in all required professional courses in their major.

At least four terms of co-operative education (work experience in industrial/ engineering/clinical/academic settings) are necessary to earn a co-op engineering degree accredited by the Accreditation Board for Engineering and Technology (ABET). At Drexel, this is accomplished through a five-year degree program involving six terms (18 months) of co-op assignments. In addition, there is the option of a four-year degree program involving two terms of co-op (or a six-month internship), but this is not a co-op engineering degree. The School has undergone its ABET accreditation review. Accreditation is expected in September 2002. When accreditation is granted, it will apply retroactively to students who have graduated from the program. Currently, all of the University’s undergraduate engineering programs are ABET accredited.

Writing Intensive Course Requirements
In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year,

beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Curricular Organization

The first two years of the undergraduate biomedical engineering program takes place in the College of Engineering and is based on the Drexel Engineering Curriculum (tDEC). The curriculum evolved from the Enhanced Educational Experience for Engineering Students Project, the National Science Foundation (NSF)–funded initiative to re-engineer undergraduate engineering education. Since its institutionalization in 1994, the curriculum has served as a national model for an integrated lower-division engineering curriculum and has established Drexel as a leader in engineering education innovation. Its success culminated in the evolution of the upper-division engineering curriculum developed under the auspices of the Gateway Engineering Education Coalition, funded again by NSF and composed of 10 major universities led by Drexel University. Reaching beyond curricular innovation to the human dimension of learning, educational methods, and assessment tools, the Gateway project has set in motion an academic culture change that has provided a framework for curricular integration and exciting interdisciplinary programs.

Biomedical engineering majors study the same subjects as students in the College of Engineering during the three terms of the first year. During the two terms of the sophomore year, there is a high degree of similarity. Students can transfer from one engineering major to another without significant loss of time until the end of the second year. These first five terms are devoted to subjects that form the foundation of the engineering curriculum. Courses in the biomedical engineering core curriculum provide an integrated view of the basic life and physical sciences and an introduction to the art of engineering through group projects and case studies. The first-level professional courses, also referred to as “core courses,? are completed by the junior year under individualized faculty advising. The senior year is mainly focused on professional electives in biomedical engineering to help students concentrate in a specialization area of biomedical engineering, including biomechanics and human performance, biomaterials and tissue engineering, biomedical systems and imaging, neuroengineering, human performance, and bioinformatics.

Liberal Studies Program

The Liberal Studies Program is designed to give engineering students a foundation in the following areas: English, history of the engineering profession and its impact on modern society, ethical standards required for the practice of the profession, and an in-depth study in a specific discipline in liberal studies.

All engineering majors must take 10 courses. Five of the 10 courses are designated as follows and must be completed by all engineering majors:

Designated liberal studies course requirements	
BMES 338	**Biomedical Ethics and Law**
HIST 285	**Technology in Historical Perspective**
HUM 106	**Humanities and Communications I**
HUM 107	**Humanities and Communications II**
HUM 108	**Humanities and Communications III**

The five remaining liberal studies course requirements are undesignated and can be chosen from the disciplines listed below. Any course selected from the categories

below meets this requirement, except language courses below 200 level and survey, performance, studio, or skills courses. Two of the five courses must comprise a sequence and therefore must be in the same discipline.

- *Anthropology*
- *Architectural/Social History*
- *Art History*
- *Communications*
- *Dance*
- *History*
- *Language (200 level and above)*
- *Literature*
- *Music*
- *Philosophy*
- *Political Science*
- *Psychology*
- *Sociology*
- *Theater*

Electives

In addition to the electives in the Liberal Studies Program, there are two types of elective sequences in the engineering curricula: technical electives and free electives.

Technical electives are courses in engineering, science, management, or entrepreneurship that build on the required professional courses and lead to a specific technical specialization. Possible elective sequences should be discussed with and approved by advisors before the end of the junior year.

Free electives are any courses for which students are eligible and that are not remedial in nature for engineering students.

Accelerated Program and Bachelor's/Master's Dual Degree Program

The Accelerated Program provides opportunities for highly competitive and strongly motivated students to progress toward their educational goals at their own pace. Primarily through advanced placement, credit by examination, flexibility of scheduling, and independent study, the program makes it possible to complete the undergraduate curriculum and initiate graduate study in less than the five years required by the standard curriculum. Students enrolled in this program may take advantage of the five-year Bachelor's/Master's Dual Degree program described in Academic Regulations.

Minor and Double Major Programs

The minor in biomedical engineering is designed for students who have taken the necessary TDEC courses in engineering or have obtained the equivalent background. The minor courses are:

Course		Credits
BIO 201	**Human Physiology I**	4.0
BIO 203	**Human Physiology II**	4.0
BMES 321	**The Living Engine**	4.0
BMES 322	**The Body Synthetic**	4.0
BMES 401	**Biosensors I***	4.0
BMES 402	**Biosensors II***	4.0
BMES	**Laboratories**	4.0

*** Or equivalent as determined by the School.**

Biomedical engineering students can also minor in another engineering or science discipline. A double major option is also available with other engineering disciplines.

Preprofessional Programs

Students who want to prepare for admission to schools of medicine, dentistry, or veterinary medicine, including the B.A./B.S./M.D. and early assurance programs at the Drexel College of Medicine, may obtain professional counseling and assistance from the Office of Preprofessional Programs, 215-895-2437.

Biomedical Engineering

Bachelor of Science Degree: 194.0 credits

Biomedical engineering is an innovative Bachelor of Science degree program developed and delivered in collaboration with the College of Engineering. It prepares students to conceive, design, and develop devices and systems that improve human health and quality of life. Biomedical engineering is the convergence of life sciences with engineering. Biomedical engineers combine the strengths of both fields. From child car seats and football helmets to drug-delivery systems, minimally invasive surgery, and noninvasive imaging technology, the work of the biomedical engineer makes a difference in everyone's life.

The undergraduate biomedical engineering curriculum is designed to strike a balance between academic breadth in biomedical engineering and concentration in biomechanics, biomaterials and tissue engineering, biomedical systems and imaging, neuroengineering, human performance, and bioinformatics. Following the Drexel Engineering Curriculum/Gateway model, the program provides innovative experiences in hands-on experimentation, engineering design, and opportunities for personal growth, as well as the development of leadership, entrepreneurship, and communication skills. Drexel's co-operative education alternates classroom study with periods of paid professional employment to prepare students for the workforce and enable them to adapt to rapid changes occurring in society.

Working with a faculty advisor, students select their core courses from a list of electives offered by the School of Biomedical Engineering, Science, and Health Systems and the Departments of Bioscience and Biotechnology, Chemistry, Physics, Chemical Engineering, Mechanical Engineering, Materials Engineering, Electrical and Computer Engineering, and Mathematics and Computer Science, and the College of Information Science and Technology.

Degree Requirements

General education requirements		Credits
HIST 285	**History of Technology**	3.0
HUM 106	**Humanities and Communications I**	3.0
HUM 107	**Humanities and Communications II**	3.0
HUM 108	**Humanities and Communications III**	3.0
UNIV R101	**The Drexel Experience**	4.0
	Liberal studies electives	15.0
	Free electives	6.0

Engineering core courses		Credits
TDEC 110	**Mathematical Foundations of Engineering I**	3.0

TDEC 111	**Physical Foundations of Engineering I**	3.0
TDEC 112	**Mathematical Foundations of Engineering II**	3.0
TDEC 113	**Physical Foundations of Engineering II**	3.0
TDEC 114	**Mathematical Foundations of Engineering III**	3.0
TDEC 115	**Physical Foundations of Engineering III**	3.0
TDEC 120	**Chemical and Biological Foundations of Engineering I**	3.0
TDEC 121	**Chemical and Biological Foundations of Engineering II**	3.0
TDEC 122	**Chemical and Biological Foundations of Engineering III**	3.0
TDEC 130	**Engineering Design and Laboratory I**	4.0
TDEC 131	**Engineering Design and Laboratory II**	4.0
TDEC 132	**Engineering Design and Laboratory III**	4.0
TDEC 201	**Energy I**	3.0
TDEC 202	**Energy II**	3.0
TDEC 211	**Materials I**	3.0
TDEC 212	**Materials II**	3.0
TDEC 221	**Systems I**	3.0
TDEC 222	**Systems II**	3.0
TDEC 231	**Evaluation/Presentation of Experimental Data I**	4.0
TDEC 232	**Evaluation and Presentation of Experimental Data II**	4.0

Biomedical engineering requirements		**Credits**
BIO 201	**Human Physiology I**	4.0
BIO 203	**Human Physiology II**	4.0
BMES 321	**The Living Engine**	4.0
BMES 322	**The Body Synthetic**	4.0
BMES 401	**Biosensors I**	4.0
BMES 402	**Biosensors II**	4.0
	BME laboratories (4)	8.0
	BME professional electives (2)*	6.0
	Interdisciplinary courses (4)**	16.0
	BME core electives (7)	30.0
	Senior project design (3)	8.0

***Working with a faculty advisor, biomedical engineering majors can satisfy their biomedical engineering core and professional course requirements by selecting from the following list of courses or sequences once they have completed the necessary prerequisites: Biomaterials, Biomechanics, Transport Phenomena in Living Systems, Biomedical Signals and Systems, Biomedical Imaging, Biomedical Informatics, and Chronoengineering.**

****Biomedical engineering majors can select the interdisciplinary courses from the list available for all engineering students. Recommended courses include Bioinformatics, Biomedical Informatics, Biomedical Instrumentation, Modeling Methods in Biology, Biometry, Introduction to Biophysics, and Engineering Mathematics.**

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.

Health Systems and Technology

The B.S. degree in health systems and technology is designed to serve as an educational upgrade for health care professionals with associate's degrees or individuals with similar levels of training obtained through other sources (e.g., military academies/schools). The degree is being offered in collaboration with the Richard C. Goodwin College of Evening and Professional Studies.

For many allied health professionals, the pathway for career advancement is blocked by the lack of an advanced degree. The objective of this program is to provide these professionals with advanced training in business, computer science and informatics, communication and presentation skills, biomedical instrumentation, and biostatistics to enable them to circumvent this limitation and advance professionally. This program is specifically tailored for the working health care professional seeking career advancement and educational flexibility. For further information, please contact the Richard C. Goodwin College of Evening and Professional Studies at 215-895-2159.

Hospitality Management

The nation’s second-fastest-growing industry, hospitality management employs some 15 million people. Positions for hospitality professionals include opportunities in the restaurant industry; food service and beverage brokers; restaurants; resorts, casinos, and cruise lines; private clubs; hotels and motels; catering operations; travel agencies; and bureaus of tourism.

The Goodwin College of Professional Studies offers degree programs in:

- Hospitality management
- Culinary arts

Concentrations include food and beverage management, hotel management, and tourism and travel. Added values include a minor in business, strong communication skills, and a solid background in information technology.

Culinary Arts

Bachelor of Science Degree: 184.0 credits

The culinary arts program prepares students for leadership positions in the fine-foods segment of the hospitality industry. This baccalaureate degree in culinary arts is among the first of its kind in the United States. Prior to this program, chefs have been trained in vocational programs or apprenticeships. This program comprises approximately equal parts liberal arts, business and administration, hospitality management, and culinary arts. Upon completing the program, students have an understanding of how to design or create a desired environment, how to market it, and how to deliver it to the customer. Students also receive the equivalent of a minor in business administration as well as completing the first year of foundation courses required for an MBA degree at Drexel.

The bachelor degree in culinary arts is completed in five years, consisting of two years of full-time study and three years of part-time study (2+3 option), during which the student works full time in industry.

Culinary arts students are invited to spend two terms of their junior year in a study-abroad program, Drexel in London, earning up to 18 credits and participating in an 11-week co-operative education experience. The program's emphasis is on understanding British culture and the global implications of the hospitality industries.

General education requirements		Credits
COM 280	**Public Relations**	3.0
CS 161	**Introduction to Computing**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Analysis I**	4.0
MATH 102	**Introduction to Analysis II**	4.0
NFS 101	**Introduction to Nutrition and Foods**	3.0
NFS 270	**Safety and Sanitation**	4.0
UNIV 101	**The Drexel Experience**	4.0
	Arts and humanities electives	9.0
	Social science electives	6.0
	Free electives	9.0

Business minor courses	Credits

ACCT 115	**Financial Accounting I**	5.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
FIN 301	**Introduction to Finance**	5.0
MKTG 301	**Introduction to Marketing Management**	5.0
ORGB 300	**Organizational Behavior**	4.0
POM 300	**Production and Operations**	4.0
STAT 201	**Quantitative Methods**	4.0

Departmental requirements		Credits
HRM 110	**Introduction to the Hospitality Industry**	3.0
HRM 115	**Culinary Science**	3.0
HRM 120	**Principles of Food-Service Management**	3.0
HRM 130	**Tourism I**	3.0
HRM 135	**Tourism II**	3.0
HRM 215	**Commercial Food Production**	3.0
HRM 200	**Productivity Software for the Hospitality Industry**	3.0
HRM 230	**Design Application Seminar**	3.0
HRM 310	**Hospitality Accounting Systems**	3.0
HRM 320	**Hospitality Management Information Systems**	3.0
HRM 330	**Hospitality Marketing**	3.0
HRM 335	**Beverage Management**	3.0
HRM 410	**Laws of Hospitality Industry**	3.0
HRM 455	**Hospitality Human Resources**	3.0

Culinary arts requirements		Credits
CULA 200	**Professional Skills Laboratory I**	1.5
CULA 205	**Professional Skills Laboratory II**	1.5
CULA 210	**Professional Skills Laboratory III**	1.5
CULA 215	**Foundations of Professional Baking**	3.0

CULA 220	**Patisserie I**	2.0
CULA 225	**Patisserie II**	2.0
CULA 230	**Major Techniques and Traditions**	3.0
CULA 235	**Professional Dining Room Management**	1.5
CULA 300	**Vegetarian Cuisine**	3.0
CULA 305	**The Italian Tradition**	3.0
CULA 310	**The French Tradition**	3.0
CULA 315	**The American Tradition**	3.0
CULA 320	**Advanced Culinary Studio**	3.0
CULA 325	**Charcuterie and Garde Manger**	2.0
CULA 400	**Directed Study With a Master Chef**	2.0
CULA 405	**Culture and Gastronomy I**	2.0
CULA 410	**Culture and Gastronomy II**	2.0
CULA 415	**Food Styling and Show Competition**	2.0
CULA 420	**Senior Design Project**	3.0
HRM 465	**Special Topics: Major Techniques and Traditions II**	2.0

Hospitality Management

Bachelor of Science Degree: 183.0 credits

Through leadership in teaching, scholarship, research, and co-operative education, the hospitality management program educates women and men for management careers in the design, marketing, and delivery of the hospitality environment or experience. The hospitality management program is accredited by the Accreditation Commission for Programs in Hospitality Administration (ACPHA).

The program, which incorporates a minor in business administration, combines professional management techniques, accounting and finance principles, computerized database and management information systems, and the art and science of travel, lodging, and food as it is delivered and perceived in the hospitality environment. Students choose specializations from among three tracks: food and beverage management; hotel management; and tourism and travel management.

The program is designed to prepare graduates for a career in hospitality management at local, national, and international levels, including tour-operating companies, travel agencies, air companies, cruise lines, restaurants, luxury hotels, lodging chains, resorts, casinos, convention centers, colleges and universities, business and industrial cafeterias, caterers, and multi-unit chains.

Hospitality management students are invited to spend two terms of their junior year in a study-abroad program, Drexel in London, earning up to 18 credits and participating in an 11-week co-operative education experience. The program's emphasis is on understanding British culture and the global implications of the hospitality industries.

General education requirements		Credits
COM 280	**Public Relations**	3.0
CS 161	**Introduction to Computing**	3.0
HUM 101	**Composition**	3.0
HUM 102	**Reading and Research**	3.0
HUM 103	**Techniques of Analysis and Evaluation**	3.0
MATH 101	**Introduction to Analysis I**	4.0
MATH 102	**Introduction to Analysis II**	4.0
NFS 101	**Introduction to Nutrition and Foods**	3.0
NFS 270	**Safety and Sanitation**	4.0
UNIV 101	**The Drexel Experience**	4.0
	Foreign language courses or arts and humanities electives	12.0
	Social science electives	6.0

	Free electives	12.0

Business minor courses		**Credits**
ACCT 115	**Financial Accounting I**	5.0
ECON 201	**Economics I**	4.0
ECON 202	**Economics II**	4.0
FIN 301	**Introduction to Finance**	5.0
MKTG 301	**Introduction to Marketing Management**	5.0
ORGB 300	**Organizational Behavior**	4.0
POM 300	**Production and Operations**	4.0
STAT 201	**Quantitative Methods**	4.0

Departmental requirements		**Credits**
HRM 110	**Introduction to the Hospitality Industry**	3.0
HRM 115	**Culinary Science**	3.0
HRM 120	**Principles of Food-Service Management**	3.0
HRM 130	**Tourism I**	3.0
HRM 135	**Tourism II**	3.0
HRM 200	**Productivity Software for the Hospitality Industry**	3.0
HRM 215	**Commercial Food Production**	3.0
HRM 230	**Design Application Seminar**	3.0
HRM 310	**Hospitality Accounting Systems**	3.0
HRM 320	**Hospitality Management Information Systems**	3.0
HRM 330	**Hospitality Marketing**	3.0
HRM 335	**Beverage Management**	3.0
HRM 410	**Laws of Hospitality Industry**	3.0
HRM 455	**Hospitality Human Resources**	3.0
HRM 465	**Special Topics: Advanced Information Systems**	3.0
	Concentration courses	21.0-22.0
	Departmental electives	15.0

Concentrations

Food and Beverage Management (F&B)

Courses		Credits
HRM 220	**Purchasing for the Hospitality Industry**	3.0
HRM 250	**Contract Food-Service Management**	3.0
HRM 315	**Continental, Ethnic, and Regional Cuisine**	3.0
HRM 340	**Catering Management**	3.0
HRM 415	**Fine Dining**	4.0
HRM 435	**Wine and Spirits**	3.0
HRM 465	**Special Topics: Cost Controls in Hospitality**	3.0

Hotel Management and Administration (HMA)

Courses		Credits
HRM 345	**Convention and Trade Shows Management**	3.0
HRM 420	**Hotel/Restaurant Architecture:History and Design**	3.0
HRM 465	**Special Topics: Cost Controls in Hospitality**	3.0
HRM 465	**Special Topics: Franchise Management in HMA**	3.0
HRM 465	**Special Topics: Hotel Management Strategies**	3.0
HRM 465	**Special Topics: Hotel Sales and Marketing**	3.0
HRM 465	**Special Topics: Resort Development**	3.0

Tourism and Travel (T&T)

Courses		Credits
HRM 345	**Convention and Trade Shows Management**	3.0
HRM 399	**Guest Lecture Series**	3.0
HRM 465	**Special Topics: Airline Operations**	3.0
HRM 465	**Special Topics: Cultural and Heritage Tourism**	3.0
HRM 465	**Special Topics: Current Research in T&T**	3.0
HRM 465	**Special Topics: TTOO and TTAA Management**	3.0
HRM 465	**Special Topics: Tourism Economics**	3.0

Reserve Officers' Training Corps

Air Force Reserve Officers' Training Corps

Students are eligible to participate in the Air Force Reserve Officers' Training Corps (AFROTC) through a cross-enrollment agreement with St. Joseph's University. All aerospace studies courses will be held on the St. Joseph's campus. The AFROTC program enables a college student to earn a commission as an Air Force officer while concurrently satisfying requirements for his or her baccalaureate degree.

The program of aerospace studies at St. Joseph's University offers one-year, two-year, and four-year curricula leading to a commission as a second lieutenant in the Air Force. In the four-year curriculum, a student takes the General Military Course (GMC) during the freshman and sophomore years, attends a four-week summer training program, and then takes the Professional Officer Course (POC) in the junior and senior years. A student is under no contractual obligation to the Air Force until entering the POC or accepting an Air Force scholarship. In the two-year curriculum, a student attends a five-week summer training program and then enters the POC in the junior year. In the one-year curriculum, a senior or graduate student can enroll in aerospace studies and, after completing the undergraduate degree or graduate coursework, attend a seven-week summer training program and be commissioned upon completion of summer training.

The subject matter of the freshman and sophomore years is developed from a historical perspective and focuses on the scope, structure, and history of military power, with an emphasis on the development of air power. During the junior and senior years, the curriculum concentrates on the concepts and practices of leadership and management, and the role of national security forces in contemporary American society.

In addition to the academic portion of the curricula, each student participates in a leadership laboratory for two hours each week, during which the day-to-day skills and working environment of the Air Force are discussed and explained. The leadership lab utilizes a student organization designed for the practice of leadership and management techniques.

Air Force ROTC offers one-, two-, and three-year scholarships on a competitive basis to qualified applicants. All scholarships cover tuition, lab fees, and books, plus a tax-free monthly stipend. All members of the POC, regardless of scholarship status, receive the tax-free monthly stipend.

For further information on the cross-enrollment program, scholarships, and career opportunities, contact the Professor of Aerospace Studies, AFROTC Det 750, Saint Joseph’s University, Philadelphia, PA 19131; 610-660-3190; rotc@sju.edu.

Army Reserve Officers' Training Corps

The purpose of the Army Reserve Officers' Training Corps program is to provide this nation with leaders of character for our Army, Army Reserve, and National Guard. ROTC training is also intended to foster ideals of patriotism; promote an understanding of the role of the citizen-soldier; stimulate interest in a military career; and develop character, self-discipline, and leadership ability. Army ROTC is a

college elective, and enrollment does not require military service.

Students who satisfactorily complete ROTC course requirements are commissioned as second lieutenants in the United States Army, Army Reserve, or National Guard. Drexel graduates who receive their commission through ROTC may apply for a commission in any branch of the Army for which they are qualified.

The military science program is divided into the basic course and the advanced course. The basic course normally coincides with the student's first two years of college. The purpose of the course is threefold: to develop certain military skills, to give the student sufficient information to decide whether to continue in the advanced course, and to allow the instructors an opportunity to evaluate the student's potential to become an officer. It consists of four or five military science courses and weekly attendance at Leadership Laboratories each term the cadet is in school. Except for scholarship cadets, no military obligation is incurred by students participating in these courses. Basic course credit may be granted to students who successfully complete a five-week leader's training course at Fort Knox, Kentucky, between the sophomore and junior years. Veterans may also receive credit for the basic course.

The advanced course is designed to prepare students for commissioned service. The first year of instruction (first two years for co-op students) is directed toward preparation for the six-week Advanced Camp at Fort Lewis, Washington. The final year is devoted to preparation for acceptance of a commission.

To be admitted to the advanced course, a student must have credit for the two-year basic course, must volunteer, must be selected by the professor of military science, and must successfully complete the required screening and physical tests.

Enlisted Army Reservists and National Guardsmen may apply for the Simultaneous Membership program, which permits them to serve as officer trainees with their units and receive commissions upon completion of the ROTC advanced course. Veterans' benefits are not affected by entry into this program, in most cases.

Airborne training, helicopter air assault training, mountain warfare, Northern Warfare training, and Cadet Troop Leadership Training with a Regular Army unit are available to interested cadets.

Twice per school year, cadets are required to participate in a field training exercise. These exercises are usually two to three days in duration and are conducted at Fort Dix, New Jersey, or Fort Indiantown Gap, Pennsylvania. The field training exercises give students a chance to put into practice skills learned in the classroom and during Leadership Laboratories.

Uniforms—worn during Leadership Laboratory periods and field training exercises—are issued free of charge to all students enrolled in ROTC. Students are responsible for maintaining the uniforms and returning them prior to going on co-op.

The Army offers scholarships that pay up to $17,000 per year toward college tuition. Additionally, Drexel provides an ROTC grant of up to $5,500 per year for scholarship winners. The grant can be applied to any "billable charges." All scholarship students receive a tax-free subsistence allowance of $250 to $400 each month they are in school, for up to ten months per year. Scholarship students incur an obligation to serve four years on active duty or eight years in the Army Reserves or National Guard after being commissioned. A student does not have to be enrolled in ROTC to apply for these scholarships. Further information on the scholarships and Army ROTC is available from the Department of Military Science at 215-590-8808/09.

The following represents a typical sequence of study to complete the military science requirements:

4-Year Student

First Year (MS I)

MLSC 100	**Leadership Laboratory**
MLSC 120	**Methods of Instruction in Military Skills**
MLSC 130	**Introduction to Leadership**

Second Year (MS II)

MLSC 210	**Land Navigation**
MLSC 220	**Military Leadership**
MLSC 310	**Small Unit Tactics**

Third Year (MS IIIB)

MLSC 320	**Platoon Tactics**
MLSC 370	**Advanced Military Skills and Staff Functions I**
MLSC 380	**Advanced Military Skills and Staff Functions II**

Fourth Year (MS IV)

MLSC 410	**Military Ethics and Values: Overview of Army Systems**
MLSC 420	**Training Management Seminar**
MLSC 430	**Junior Officer Orientation**

5-Year Student

First Year (MS I)

MLSC 100	**Leadership Laboratory**
MLSC 120	**Methods of Instruction in Military Skills**
MLSC 130	**Introduction to Leadership**

Second Year (MS II)

MLSC 210	**Land Navigation**

MLSC 220	**Military Leadership**

Third Year (MS IIIA)

MLSC 310	**Small Unit Tactics**
MLSC 320	**Platoon Tactics**

Fourth Year (MS IIIB)

MLSC 370	**Advanced Military Skills and Staff Functions I**
MLSC 380	**Advanced Military Skills and Staff Functions II**

Fifth Year (MS IV)

MLSC 410	**Military Justice, Ethics, and Professionalism**
MLSC 420	**Training Management Seminar**
MLSC 430	**Junior Officer Orientation**

The five-week advanced camp counts as an industry term for co-op students. Each term a student is in school, he or she also participates in the weekly Leadership Laboratory (MLSC 100). To receive a commission, cadets must also take one course in the following area:

Military history

HIST 230	**U.S. Military History I (to 1900)**
HIST 231	**U.S. Military History II (since 1900)**

Naval Reserve Officers' Training Corps

Students are eligible to participate in the Naval Reserve Officers' Training Corps (NROTC) through a cross-enrollment agreement with the University of Pennsylvania. All naval science courses are held on Penn's campus. The NROTC program enables a college student to earn a commission in the Navy or the Marine Corps while concurrently satisfying requirements for his or her baccalaureate degree. Scholarship and nonscholarship programs are available.

Navy-option scholarship and college program (nonscholarship) students must enroll in Naval Science (NSCI) 101 and 102 during their freshman year, NSCI 201 and 202 during their sophomore year, NSCI 301 and 302 in their junior year, and NSCI 401 and 402 in their senior year. Those seeking commissions in the Marine Corps will enroll in NSCI 310 and 410 instead of 301-302 and 401-402.

Scholarship program students must complete one year of calculus, one year of calculus-based physics, a course in computer science, one course in American military history/national security policy, and one year of English. College program students must complete one year of college-level algebra, one year of physical science courses, one semester of a computer science course, and one year of English. Students must check with their naval science instructors to determine specific courses that fulfill the above requirements.

In addition to the above, all students are required to attend a two-hour professional laboratory period scheduled on Wednesday afternoons (no academic credit) that emphasizes military drill, physical fitness, and leadership/military topics.

For further information regarding physical and other qualifications for admission and other matters pertaining to participation in the NROTC program, you can write to the Professor of Naval Science, NROTC Unit, Hollenback Center, 3000 South Street, Philadelphia, PA 19104; 215-898-7436; fax: 215-573-2067.

Writing Intensive Course Requirements

In order to graduate, all students must pass three writing intensive courses after their freshman year. Two writing intensive courses must be in a student's major, one may be in an elective. Writing intensive courses are designated with a "WI" in the course catalog. Students are advised to take one writing intensive class each year, beginning with the sophomore year. Transfer students need to meet with an academic advisor to review the number of writing intensive courses required to graduate. For more information on writing intensive courses, see the Drexel University Writing Program's Writing Intensive Course page.