

Applied Science

Introduction

The Applied Science program offers a unique educational experience for students to learn science by doing science. The program emphasizes flexibility through a broad scientific base along with experience through a chosen career emphasis. In a world of new products and processes, the program also fosters the creativity needed to contribute to new scientific advances. Our program prepares graduates for a variety of expanding careers in biotechnology, nanotechnology, health sciences, materials science and science education. The strong academic content of the Applied Science program will also prepare graduates for entry into a variety of professional (such as chiropractic, dental, medical, optometry, pharmacy, physical therapy or veterinary) and graduate schools.

The curriculum is based on a core of chemistry, physics, biology and mathematics. Students will explore cutting edge topics in nanotechnology and biotechnology in addition to the many facets of applied science, including technical writing, data analysis, interpersonal communication and experiment design. Principles in management, marketing, manufacturing, and finance are introduced.

In addition to working with instructors from a broad range of

fields, students gain significant hands-on experience through a field or cooperative education experience. This versatility offers the qualities that employers are looking for in today's college graduates — interpersonal and problem-solving skills, high energy level and good judgment.

Our graduates are able to enter a myriad of occupations and career paths after graduation. Some of our graduates have chosen to enter the work force directly by becoming scientific sales representatives or laboratory technicians. Many of our graduates have continued with their passion in science and have chosen graduate schools in fields ranging from marine microbiology to bio-nano chemistry, while other graduates have entered dental or pharmacy schools.

In addition to fulfilling the university's basic admission requirements, Applied Science applicants must also have an ACT math score of at least 22 (SAT math 510) and either rank in the upper 40 percent of your high school class (or GPA of 3.0), or have a composite ACT score of 22. Nontraditional or transfer student admission will be based on current admission standards with guidance from the program director.

Program Requirements for the Interdisciplinary Science Concentration

Total for Graduation	120 credits
General Education	42-43 credits
Major Studies	77-78 credits

General Education

42-43 credits required

A. Communication Skills 8 credits

ENGL-101 Freshman English – Composition or	
ENGL-111 Freshman English – Honors I	3
ENGL-102 Freshman English – Reading and Related Writing or	
ENGL-112 Freshman English – Honors II	3
SPCOM-100 Fundamentals of Speech	2

B. Analytic Reasoning 7-8 credits

MATH-153 Calculus I or	
MATH-156 Calculus and Analytic Geometry I	4-5
STAT-320 Statistical Methods or	
STAT-330 Probability and Statistics for Engineering and the Sciences.....	3

C. Health and Physical Education 2 credits

Courses must be from areas of health, physical education or nutrition.

D. Humanities and the Arts 9 credits

PHIL-235 General Ethics	3
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Remaining courses must be from two or more areas including creative arts, history, literature, music appreciation, and performing arts.

E. Social and Behavioral Sciences 9 credits

Courses must be from three or more areas including anthropology, economics, geography, political science, psychology and sociology.

F. Natural Sciences (with Lab) 5 credits

CHEM-135 College Chemistry I	5
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G. Technology 2 credits

Major Studies

77-78 credits required

Required Courses 43 credits

APSC-101 Applied Science Profession I	1
APSC-311 Issues for Science Professionals	3
APSC-349 Cooperative Education Program in Applied Science or	
APSC-398 Field Experience in Applied Science	1-8
APSC-401 Applied Science Profession II	1
BIO-135 Organismal Biology	4
BIO-136 College Molecular Cell Biology I	5
CHEM-136 College Chemistry II	5
CHEM-201 Organic Chemistry I	4
CHEM-331 Quantitative Analysis	3
CHEM-335 Instrumental Methods of Analysis	3
ENGL-415 Technical Writing	3
PHYS-241 College Physics I or	
PHYS-281 University Physics I	5
PHYS-242 College Physics II or	
PHYS-282 University Physics II	5

Selectives 14 credits

Choose any 200 level or higher science-related courses approved by your program director to fulfill the 120 credit graduation requirement.

Minor or Second Major 18-35 credits

Choose a minor that is not Chemistry, Biology, or Physics. Students should work with a minor adviser to complete requirements. In lieu of a minor, students may apply credits from a completed second major. Students must work with both program directors to meet requirements for each major and recognize that completion of two majors will exceed 120 credits.

Program Requirements for the Biotechnology Concentration

Total for Graduation	120 credits
General Education	42-43 credits
Major Studies	77-78 credits

General Education

42-43 credits required

A. Communication Skills **8 credits**

ENGL-101	Freshman English – Composition <i>or</i>	
ENGL-111	Freshman English – Honors I	3
ENGL-102	Freshman English – Reading and Related Writing <i>or</i>	
ENGL-112	Freshman English – Honors II	3
SPCOM-100	Fundamentals of Speech	2

B. Analytic Reasoning **7-8 credits**

MATH-153	Calculus I <i>or</i>	
MATH-156	Calculus and Analytic Geometry I	4-5
STAT-320	Statistical Methods <i>or</i>	
STAT-330	Probability and Statistics for Engineering and the Sciences.....	3

C. Health and Physical Education **2 credits**

Courses must be from areas of health, physical education or nutrition.

D. Humanities and the Arts **9 credits**

PHIL-235	General Ethics	3
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Remaining courses must be from two or more areas including creative arts, history, literature, music appreciation, and performing arts.

E. Social and Behavioral Sciences **9 credits**

Courses must be from three or more areas including anthropology, economics, geography, political science, psychology and sociology.

F. Natural Sciences (with Lab) **5 credits**

CHEM-135	College Chemistry I	5
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G. Technology **2 credits**

Major Studies

77-78 credits required

Required Courses **65-69 credits**

APSC-101	Applied Science Profession I	1
APSC-311	Issues for Science Professionals	3
APSC-349	Cooperative Education Program in Applied Science <i>or</i>	
APSC-398	Field Experience in Applied Science	1-8
APSC-401	Applied Science Profession II	1
BIO-135	Organismal Biology	4
BIO-136	College Molecular Cell Biology I	5
BIO-235	Molecular Cell Biology II	4
BIO-370	Biotechnology	3
BIO-400	Special Topics in Biotechnology	1-2
BIO-470	Advanced Biotechnology	5
BIO-489	Advanced Biology Experience	1-4
CHEM-136	College Chemistry II	5
CHEM-201	Organic Chemistry I	4
CHEM-204	Organic Chemistry II Lecture	3
CHEM-206	Organic Chemistry II Laboratory	1
CHEM-311	Biochemistry	4
CHEM-331	Quantitative Analysis	3
CHEM-412	Advanced Biochemistry	3
ENGL-415	Technical Writing	3
PHYS-241	College Physics I <i>or</i>	
PHYS-281	University Physics I	5
PHYS-242	College Physics II <i>or</i>	
PHYS-282	University Physics II	5

Selective Courses **8-13 credits**

Choose selectives that are 200 level or higher biotechnology-related courses approved by your adviser to fulfill the 120 credit graduation requirement.

Program Requirements for the Environmental Science Concentration

Total for Graduation	120 credits
General Education	42-43 credits
Major Studies	77-78 credits

General Education

42-43 credits required

A. Communication Skills 8 credits

ENGL-101	Freshman English – Composition or	
ENGL-111	Freshman English – Honors I	3
ENGL-102	Freshman English – Reading and Related Writing or	
ENGL-112	Freshman English – Honors II	3
SPCOM-100	Fundamentals of Speech	2

B. Analytic Reasoning 7-8 credits

MATH-153	Calculus I or	
MATH-156	Calculus and Analytic Geometry I	4-5
STAT-320	Statistical Methods or	
STAT-330	Probability and Statistics for Engineering and the Sciences.....	3

C. Health and Physical Education 2 credits

Courses must be from areas of health, physical education or nutrition.

D. Humanities and the Arts 9 credits

PHIL-235	General Ethics	3
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Remaining courses must be from two or more areas including creative arts, history, literature, music appreciation, and performing arts.

E. Social and Behavioral Sciences 9 credits

GEOG-251	Introduction to Geography and Geographic Information Systems.....	4
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Remaining courses must be from two or more areas including anthropology, economics, geography, political science, psychology and sociology.

F. Natural Sciences (with Lab) 5 credits

CHEM-135	College Chemistry I	5
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G. Technology 2 credits

Major Studies

77-78 credits required

Environmental Science Course Requirements 54 credits

APSC-101	Applied Science Profession I	1
APSC-311	Issues for Science Professionals	3
APSC-349	Cooperative Education Program in Applied Science or	
APSC-398	Field Experience in Applied Science	1-8
APSC-401	Applied Science Profession II	1
BIO-111	Science, Society and the Environment or.....	
BIO-141	Plants and People	4
BIO-135	Organismal Biology	4
BIO-136	College Molecular Cell Biology I	5
BIO-350	Ecology	3
BIO-351	Ecology Lab	2
BIO-444	Problem Solving in Environment Studies	3
CHEM-136	College Chemistry II	5
CHEM-201	Organic Chemistry I	4
ENGL-415	Technical Writing	3
GEOG-351	Intermediate Geographic Information Systems	4
PHYS-258	Introductory Geology	2
PHYS-241	College Physics I or	
PHYS-281	University Physics I	5
PHYS-XXX	Soil Conservation	4

Environmental Science Technical Emphasis 13-15 credits

Choose one of the following emphasis areas:

Water Resources (13 credits)

BIO-306	General Microbiology	4
CHEM-331	Quantitative Analysis	3
CHEM-335	Instrumental Methods of Analysis	3
CHEM-353	Environmental Chemistry	3

Plant Sciences (14 credits)

BIO-242	Botany	4
BIO-322	Plant Pathology	3
BIO-343	Plant Physiology	4
CHEM-331	Quantitative Analysis	3

Land Resources (15 credits)

BIO-242	Botany	4
BIO-324	Plant Taxonomy	3
BIO-352	Plant Ecology	4
GEOG-451	Advanced Geographic Information Systems	4

Selective Courses xx-xx credits

Choose selective courses that are 200 level or higher in biology, chemistry or physics and approved by your adviser to fulfill the 120 credit graduation requirement.

Program Requirements for the Materials Science Concentration

Total for Graduation	121-125 credits
General Education	43-45 credits
Major Studies	78-80 credits

General Education

43-45 credits required

A. Communication Skills 8 credits

ENGL-101	Freshman English – Composition <i>or</i>	
ENGL-111	Freshman English – Honors I	3
ENGL-102	Freshman English – Reading and Related Writing <i>or</i>	
ENGL-112	Freshman English – Honors II	3
SPCOM-100	Fundamentals of Speech	2

B. Analytic Reasoning 8-10 credits

MATH-153	Calculus I <i>or</i>	
MATH-156	Calculus and Analytic Geometry I	4-5
MATH-154	Calculus II <i>or</i>	
MATH-157	Calculus and Analytic Geometry II.	4-5

C. Health and Physical Education 2 credits

Courses must be from areas of health, physical education or nutrition.

D. Humanities and the Arts 9 credits

PHIL-235	General Ethics	3
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Remaining courses must be from two or more areas including creative arts, history, literature, music appreciation, and performing arts.

E. Social and Behavioral Sciences 9 credits

Courses must be from three or more areas including anthropology, economics, geography, political science, psychology and sociology.

F. Natural Sciences (with Lab) 5 credits

CHEM-135	College Chemistry I	5
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G. Technology 2 credits

Major Studies

78-80 credits required

Required Courses 68 credits

APSC-101	Applied Science Profession I	1
APSC-311	Issues for Science Professionals.	3
APSC-349	Cooperative Education Program in Applied Science <i>or</i>	
APSC-398	Field Experience in Applied Science.	1-8
APSC-401	Applied Science Profession II	1
CHEM-136	College Chemistry II	5
CHEM-201	Organic Chemistry I.....	4
CHEM-301	Physical Chemistry Lecture.	3
CHEM-303	Physical Chemistry Laboratory.....	1
CHEM-325	Chemistry of Polymers.	4
CHEM-341	Chemistry of Materials.....	4
CHEM-440	Advanced Materials Laboratory.....	3
CHEM-470	Chemistry of Materials II.....	3
ELEC-290	Circuits and Devices.	4
ENGL-415	Technical Writing	3
MATH-250	Differential Equations with Linear Algebra <i>or</i>	
MATH-255	Differential Equations	3
MFGT-110	Materials and Manufacturing Processes <i>or</i>	
MFGT-150	Introduction to Engineering Materials.	3
MFGT-251	Polymer and Composite Processes <i>or</i>	
MFGT-253	Joining and Casting Processes.....	3
PHYS-281	University Physics I.....	5
PHYS-282	University Physics II.....	5
PHYS-325	Strength of Materials.	3
PHYS-327	Solid State Physics.....	3
STAT-330	Probability and Statistics for Engineering and the Sciences.....	3

Selective Courses 10-12 credits

Choose 3 of the following 4 selective courses:

BIO-136	College Molecular Cell Biology I	5
BIO-235	Molecular Cell Biology II.....	4
CHEM-331	Quantitative Analysis.	3
CHEM-335	Instrumental Methods of Analysis	3

Program Requirements for the Nanoscience Concentration

Total for Graduation	120-122 credits
General Education	43-45 credits
Major Studies	77 credits

Program Requirements

General Education

43-45 credits required

A. Communication Skills **8 credits**

ENGL-101	Freshman English – Composition or	
ENGL-111	Freshman English – Honors	3
ENGL-102	Freshman English – Reading and Related Writing or	
ENGL-112	Freshman English – Honors II	3
SPCOM-100	Fundamentals of Speech	2

B. Analytic Reasoning **8-10 credits**

MATH-153	Calculus I or	
MATH-156	Calculus and Analytic Geometry I	4-5
MATH-154	Calculus II or	
MATH-157	Calculus and Analytic Geometry II.	4-5

C. Health and Physical Education **2 credits**

Courses must be from areas of health, physical education or nutrition.

D. Humanities and the Arts **9 credits**

PHIL-235	General Ethics	3
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Remaining courses must be from two or more areas including creative arts, history, literature, music appreciation, and performing arts.

E. Social and Behavioral Sciences **9 credits**

Courses must be from three or more areas including anthropology, economics, geography, political science, psychology and sociology.

F. Natural Sciences (with Lab) **5 credits**

CHEM-135	College Chemistry I	5
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G. Technology **2 credits**

Major Studies

77 credits required

Required Courses **65 credits**

APSC-101	Applied Science Profession I	1
APSC-311	Issues for Science Professionals.	3
APSC-349	Cooperative Education Program in Applied Science or	
APSC-398	Field Experience in Applied Science.	1-8
APSC-401	Applied Science Profession II	1
BIO-136	College Molecular Cell Biology I	5
BIO-235	Molecular Cell Biology II.....	4
CHEM-136	College Chemistry II	5
CHEM-201	Organic Chemistry I.....	4
CHEM-301	Physical Chemistry Lecture.	3
CHEM-303	Physical Chemistry Laboratory.	1
CHEM-331	Quantitative Analysis	3
CHEM-335	Instrumental Methods of Analysis.	3
CHEM-341	Chemistry of Materials.....	4
ENGL-415	Technical Writing	3
NANO-101	Exploration of Nanotechnology	2
NANO-301	Nanostructures.	3
NANO-330	Characterization Methods of Nanomaterials.	3
NANO-401	Nanotechnology Applications	3
PHYS-281	University Physics I.....	5
PHYS-282	University Physics II.....	5
STAT-330	Probability and Statistics for Engineering and the Sciences	3

Selective Courses **12 credits**

Choose 12 credits from the following list of selective courses:

CHEM-204	Organic Chemistry II Lecture.	3
CHEM-206	Organic Chemistry II Laboratory.	1
CHEM-311	Biochemistry.....	4
CHEM-325	Chemistry of Polymers.	4
CHEM-440	Advanced Materials Laboratory.....	1-3
CHEM-470	Chemistry of Materials II.....	3
MFGT-251	Polymer and Composite Processes.....	3
MFGT-253	Joining and Casting Processes.....	3

