

College of Mathematics and Science

Academic Degree Programs



Program: **Actuarial Science**
 Major: **Actuarial Science**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Mathematics and Statistics**
 College: **Mathematics and Science**
 Major Code: **6140**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

- Math..... 3
- Life Science 4
- Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis..... 3

Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills..... 3

**Minimum
Required Hours**

Prerequisite Courses

Prerequisite Courses 0-6

Required courses:

- MATH 1513 College Algebra or High School Algebra II **AND**
- MATH 1593 Plane Trigonometry or High School Trigonometry
- OR**
- MATH 1555 College Algebra and Trigonometry or the equivalent of these courses at other institutions.

Upon completion of the above courses, corresponding university core requirements will be satisfied. (These courses are required for this major regardless of previous degrees conferred.)

Major Requirements

Actuarial Science 66

Mathematics Core 18

Required courses:

- MATH 1643 Introduction to Engineering with Computer Applications **OR**
- MATH 1743 Technology and Mathematics **OR**
- CMSC 1513 Beginning Programming
- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 3143 Linear Algebra

Actuarial Core 12

Required courses:

- # MATH 3133 Theory of Interest 1
- # MATH 4133 Theory of Interest 2
- # MATH 4223 Mathematics of Life Contingencies I
- # MATH 4233 Mathematics of Life Contingencies II

Statistics Core 15

Required courses:

- STAT 3103 Statistical Methods I
- STAT 4103 Applied Experimental Design **OR**
- STAT 4303 Nonparametric Statistics
- # STAT 4113 Mathematical Statistics I
- # STAT 4123 Mathematical Statistics II
- * STAT 4213 Applied Regression Analysis

**Minimum
Required Hours**

Finance and Insurance Electives 15

Select from the following:

- * ECON 2103 Microeconomics
- * ECON 2203 Macroeconomics
- FIN 3523 Foundations of Insurance and Risk Management
- FIN 3553 Property and Liability Insurance for the Firm
- FIN 3613 Life and Health Insurance
- * FIN 3563 Fundamentals of Business Finance
- * FIN 4253 Intermediate Business Finance
- FIN 4213 Investments

Area of Application 6

Select from the following:

- MATH 3103 Differential Equations
- MATH 3263 Numerical Analysis I
- MATH 4103 Numerical Analysis II
- MATH 4113 Introduction to Operations Research I
- MATH 4123 Introduction to Operations Research II
- MATH 4950 Internship (3 hours)

* These courses are accredited by the Society of Actuaries to earn Validation by Educational Experience (VEE) credits.

These courses will help prepare students for the professional examinations administered by the Society of Actuaries. See the Director of Actuarial Studies in MS 108 for more details.

Electives to bring total to 124

Minimum Grade Requirements

1. Average in (a) all college course work, (b) course work at UCO, and (c) major courses 2.50
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Biology**
 Major: **Biology**
 Degree: Bachelor of Science (B.S.)

Dept: Biology
 College: Mathematics and Science
 Major Code: 6000

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

- Math..... 3
- Life Science 4
- Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis..... 3

Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills..... 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....0-6

Students majoring in Biology are encouraged to complete the following courses in high school.

Two years of high school algebra and one year of Trigonometry **OR**
 MATH 1513 College Algebra **AND**
 MATH 1593 Plane Trigonometry

Major Requirements

Biology..... 67

Biology Core (required of all degree candidates) 25

Required courses:

- BIO 1204 Biology I for Majors
- BIO 1225 Biology II for Majors and Lab
- BIO 2203 Cell Biology
- BIO 3054 Microbiology for Majors and Lab
- BIO 3303 Genetics
- BIO 3543 General Ecology
- BIO 3703 Evolution

Mathematics 6

Required courses:

- MATH 2153 BioCalculus
- STAT 2103 Intro Statistics for Sciences

Chemistry..... 15

Required courses:

- CHEM 1103 General Chemistry I
- CHEM 1112 General Chemistry I - Recitation/Lab
- CHEM 1223 General Chemistry II
- CHEM 1232 General Chemistry II - Recitation/Lab
- CHEM 3303 Organic Chemistry I
- CHEM 3312 Organic Chemistry I Lab

Physics..... 4

- PHY 1114 General Physics I and Lab

Elective major courses (to bring major total to 67) 17

Selected from the following:

(One course must be a Botany course with a lab and one a Zoology course with a lab).

Botany

- BIO 3024 Plant Physiology and Lab
- BIO 3604 Plant Kingdom and Lab
- BIO 4204 Plant Ecology and Lab
- BIO 4294 Plant Taxonomy and Lab
- BIO 4354 Plant Anatomy and Lab

Zoology

- BIO 3104 Embryology and Lab
- BIO 3154 Invertebrate Zoology and Lab
- BIO 3254 Comparative Vertebrate Anatomy and Lab
- BIO 3403 Comparative Animal Physiology **OR**
- BIO 3464 Comparative Animal Physiology and Lab
- BIO 3454 Vertebrate Zoology and Lab
- BIO 3803 Mammalian Physiology I
- BIO 3813 Mammalian Physiology II
- BIO 4124 Herpetology and Lab
- BIO 4254 Animal Behavior and Lab **OR**
- BIO 4213 Animal Behavior
- BIO 4264 Mammalogy and Lab
- BIO 4714 Aquatic Entomology and Lab
- BIO 4734 Ornithology and Lab
- BIO 4754 General Entomology and Lab
- BIO 4773 Parasitology and Lab

Microbiology

- BIO 3515 Pathogenic Microbiology & Immunology and Lab
- BIO 4334 Environmental Microbiology and Lab
- BIO 4413 Virology and Lab
- BIO 4504 Mycology and Lab

Biology

- BIO 3414 Histology and Lab
- BIO 3551 Ecological Methods

Program: **Biology** - continued
 Major: **Biology**
 Degree: Bachelor of Science (B.S.)

Dept: Biology
 College: Mathematics and Science
 Major Code: 6000

**Minimum
Required Hours**

- CONTINUED FROM PREVIOUS PAGE -

BIO	4012	Introduction to Biological Research
BIO	4024	Freshwater Ecology and Lab
BIO	4103	History and Nature of Science
BIO	4324	Marine Ecology and Lab
BIO	4343	Molecular Biology and Lab
BIO	4443	Microtechnique and Lab
BIO	4454	Molecular Cell Physiology and Lab
BIO	4622	Methods of Human Dissection & Prosection
BIO	4633	Scanning Electron Microscopy and Lab
BIO	4723	Biometrics
BIO	4743	Molecular and Population Genetics
BIO	4763	Biology of Cancer
BIO	4853	General Methods Teaching Science and Lab
BIO	4910	Seminar in Biology (1-4 hours)
CHEM	3403	Biochemistry I

No more than two (2) hours of the following courses will count toward the minimum required hours for the Biology major.

BIO	2000	Topics in Biology (1-4 hours)
BIO	3000	Workshop in Biology (1-6 hours)
BIO	3990	Advanced Topics in Biology (1-4 hours)
BIO	4900	Practicum in Biology (1-4 hours)
BIO	4930	Individual Study in Biology (1-4 hours)
BIO	4950	Internship in Biology (1-8 hours)
BIO	4960	Institute in Biology (1-8 hours)
BIO	4970	Study Tour in Biology (1-2 hours)

Electives to bring total to..... 124

General Physics II is a recommended elective.

Graduating seniors must take a national assessment exam in Biology as a graduation requirement for the B.S. in Biology.

Minimum Grade Requirements

- Average in (a) all college course work, (b) course work at UCO, and (c) major courses..... 2.00**
- A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.**

**For other regulations pertaining to graduation, see
pages 63-64 of the 2012-2013 catalog.**

Program: **Biomedical Engineering**
 Major: **Biomedical Engineering**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Engineering and Physics**
 College: **Mathematics and Science**
 Major Code: **6220**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

- Math 3
- Life Science 4
- Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

• Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis 3

• Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills 3

**Minimum
Required Hours**

Support Courses

Support Courses 9-19

- PHIL 1123 Contemporary Moral Problems
- ECON 1103 Introduction to Economics
- FMKT 2323 Global Protocol and Diversity
(or Foreign Language)

Students majoring in Biomedical Engineering are encouraged to complete the following courses in high school.

- One year of High School Algebra II and Trigonometry **OR**
- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry **OR**
- MATH 1555 College Algebra and Trigonometry
- One year High School Physics **OR**
- PHY 1003 Introduction to Physics

Major Requirements

Biomedical Engineering 98-101

Biology 11

- Required courses:
- BIO 1204 Biology I for Majors
 - BIO 2203 Cell Biology
 - BIO 2604 Human Physiology and Laboratory

Chemistry 5

- Required courses:
- CHEM 1103 General Chemistry I
 - CHEM 1112 General Chemistry I Recitation/Laboratory

Engineering 48

- Required courses:
- ENGR 1112 Introduction to Engineering and Laboratory
 - ENGR 1213 Engineering Computing and Laboratory
 - ENGR 1311 Introduction to Biomedical Engineering
 - ENGR 2033 Statics
 - ENGR 2043 Dynamics
 - ENGR 2303 Electrical Science
 - ENGR 2311 Electrical Science Laboratory
 - ENGR 3203 Thermodynamics
 - ENGR 3222 Digital Logic Design and Laboratory
 - ENGR 3302 Engineering Statistics and Experimentation

**Minimum
Required Hours**

- ENGR 3323 Signals and Systems & Laboratory
- ENGR 3404 Analog Electronics and Laboratory
- ENGR 4113 Principles of Biomedical Engineering
- ENGR 4132 Biomedical Engineering Laboratory
- ENGR 4223 Biomedical Imaging
- ENGR 4233 Biomedical Instrumentation
- ENGR 4343 Biomechanics
- ENGR 4882 Senior Engineering Design I
- ENGR 4892 Senior Engineering Design II

Mathematics 14-15

- Required courses:
- MATH 2305 Accelerated Calculus 1 and 2 **OR**
 - MATH 2313 Calculus 1 **AND**
 - MATH 2323 Calculus 2
 - MATH 2333 Calculus 3
 - MATH 2343 Calculus 4
 - MATH 3103 Differential Equations

Physics 8

- Required courses:
- PHY 2014 Physics for Scientists and Engineers I and Laboratory
 - ^ PHY 2114 Physics for Scientists and Engineers II and Laboratory
- ^ A grade of "C" or better must be earned in PHY 2114.

Biomedical Engineering Elective 3

Any 3000/4000 level PHY or ENGR course with the following exceptions: PHY 3014, 3044, 3054 or 3503.

Complete all the courses from one of the following concentrations: 9-11

- Concentration A: (courses in preparation for Pre-Med fields)
- CHEM 1223 General Chemistry II
 - CHEM 1232 General Chemistry II Laboratory
 - CHEM 3303 Organic Chemistry I
 - CHEM 3323 Organic Chemistry II

Program: **Biomedical Engineering** - continued
 Major: **Biomedical Engineering**
 Degree: Bachelor of Science (B.S.)

Dept: Engineering and Physics
 College: Mathematics and Science
 Major Code: 6220

**Minimum
Required Hours**

- CONTINUED FROM PREVIOUS PAGE -

Concentration B: (courses in preparation for Instrumentation fields)

PHY	3103	Modern Physics
ENGR	3183	Electromagnetic Fields I
PHY	3883	Mathematical Physics I

The number of credits needed to meet degree requirements exceeds 124 hours and will vary according to course selection.

The following courses are strongly recommended electives:

CHEM	3403	Biochemistry
ENGR	3443	Fluid Mechanics

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO, **2.00**
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

This program requires admission to the Upper Division with special requirements. See page 54 of the 2012-2013 catalog for selective admission criteria.

Program: **Chemistry**
 Major: **Chemistry**
 Degree: Bachelor of Science (B.S.)

Dept: Chemistry
 College: Mathematics and Science
 Major Code: 6060

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

- Math 3
- Life Science 4
- Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses 5-9

Required Courses:

- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry **OR**
- MATH 1555 College Algebra and Trigonometry **OR**
High School Equivalent
- High School Physics **OR**
- PHY 1003 Introduction to Physics

Electives to bring total to 124

The following are highly recommended:

- CHEM 3343 Communication and Careers in Chemistry
- CHEM 3403 Biochemistry I
- ENG 4023 Technical Writing
- MATH 2343 Calculus 4
- PHY 3103 Modern Physics

Major Requirements

Chemistry 68

Common Core 45

Required courses:

- CHEM 1103 General Chemistry I
- CHEM 1112 General Chemistry I - Recitation/Lab
- CHEM 1223 General Chemistry II
- CHEM 1232 General Chemistry II - Recitation/Lab
- CHEM 2104 Quantitative Analysis and Lab
- CHEM 3303 Organic Chemistry I
- CHEM 3312 Organic Chemistry I Lab
- CHEM 3323 Organic Chemistry II
- CHEM 3332 Organic Chemistry II Lab
- CHEM 3454 Fundamentals of Instrumental Analysis and Lab
- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- PHY 2014 Physics for Scientists and Engineers I and Lab
- PHY 2114 Physics for Scientists and Engineers II and Lab

Advanced Chemistry 23

Required courses: 14

- CHEM 3503 Physical Chemistry I
- CHEM 3513 Physical Chemistry II
- CHEM 3602 Experimental Physical Chemistry
- CHEM 4454 Advanced Instrumental Analysis and Lab
- CHEM 4502 Directed Research and Lab

Chemistry Electives 9

(3000/4000 level; CHEM 3203 will not apply)

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO 2.25
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Chemistry**
 Major: **Chemistry - ACS Certificate**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Chemistry**
 College: **Mathematics and Science**
 Major Code: **6061**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

• Math 3

Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2

Elective Life Skills 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses 5-9

Required Courses:

MATH 1513 College Algebra **AND**

MATH 1593 Plane Trigonometry **OR**

MATH 1555 College Algebra and Trigonometry **OR**

High School Equivalent

High School Physics **OR**

PHY 1003 Introduction to Physics

Major Requirements

Chemistry - ACS Certificate 74

Common Core 45

Required courses:

CHEM 1103 General Chemistry I

CHEM 1112 General Chemistry I - Recitation/Lab

CHEM 1223 General Chemistry II

CHEM 1232 General Chemistry II - Recitation/Lab

CHEM 2104 Quantitative Analysis and Lab

CHEM 3303 Organic Chemistry I

CHEM 3312 Organic Chemistry I Lab

CHEM 3323 Organic Chemistry II

CHEM 3332 Organic Chemistry II Lab

CHEM 3454 Fundamentals of Instrumental Analysis and Lab

MATH 2313 Calculus 1

MATH 2323 Calculus 2

MATH 2333 Calculus 3

PHY 2014 Physics for Scientists and Engineers I and Lab

PHY 2114 Physics for Scientists and Engineers II and Lab

Advanced Chemistry ACS approved 29

Required courses: 24

CHEM 3403 Biochemistry I

CHEM 3503 Physical Chemistry I

CHEM 3513 Physical Chemistry II

CHEM 3602 Experimental Physical Chemistry

CHEM 4454 Advanced Instrumental Analysis and Lab

CHEM 4502 Directed Research and Lab

CHEM 4603 Advanced Organic Chemistry

CHEM 4654 Inorganic Chemistry and Lab

Elective Chemistry or Physics (3000/4000 level) 5

(Neither CHEM 3203 nor PHY 3014 will apply.)

Electives to bring total to 124

The following are highly recommended:

CHEM 3343 Communications and Careers in Chemistry

ENG 4023 Technical Writing

MATH 2343 Calculus 4

PHY 3103 Modern Physics

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO 2.25

2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Chemistry**
 Major: **Chemistry - Health Sciences**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Chemistry**
 College: **Mathematics and Science**
 Major Code: **6062**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.
 • Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11
 • Math 3
 • Life Science 4
 • Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6
 Aesthetic Analysis 3
 Critical Inquiry 3

American Historical and Political Analysis 6
 American National Government 3
 American History 3

Cultural and Language Analysis 3-4
 Second Language 4
 OR
 Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5
 Required Health Course 2
 Elective Life Skills 3

**Minimum
 Required Hours**

**Minimum
 Required Hours**

Support Courses

Support Courses 5-6

Required Courses:

- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry **OR**
- MATH 1555 College Algebra and Trigonometry **OR**
 High School Equivalent

Major Requirements

Chemistry - Health Sciences 76

Common Core 54

Required courses:

- CHEM 1103 General Chemistry I
- CHEM 1112 General Chemistry I Recitation/Lab
- CHEM 1223 General Chemistry II
- CHEM 1232 General Chemistry II Recitation/Lab
- CHEM 2104 Quantitative Analysis and Lab
- CHEM 3303 Organic Chemistry I
- CHEM 3312 Organic Chemistry I Lab
- CHEM 3323 Organic Chemistry II
- CHEM 3332 Organic Chemistry II Lab
- CHEM 3454 Fundamentals of Instrumental Analysis and Lab
- BIO 1204 Biology I for Majors
- BIO 1225 Biology II for Majors and Lab
- BIO 2203 Cell Biology
- MATH 2153 Bio-Calculus
- PHY 1114 General Physics I and Lab
- PHY 1214 General Physics II and Lab
- STAT 2103 Intro Statistics for Sciences

Advanced Course work 22

Required courses: 16

- BIO 3054 Microbiology for Majors and Lab
- CHEM 3203 Introductory Physical Chemistry
- CHEM 3403 Biochemistry I
- CHEM 3442 Experimental Biochemistry
- PHY 3044 Medical Physics and Laboratory

Elective Chemistry (3000/4000 level) 6

Electives to bring total to 124

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO 2.25
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Clinical Lab Science/Med-Tech**
 Major: **Clinical Lab Science/Med-Tech**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Biology**
 College: **Mathematics and Science**
 Major Code: **6030**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

• Math 3

• Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2

Elective Life Skills 3

Minimum
Required Hours

Minimum
Required Hours

Support Courses

Support Course 0-3

Students majoring in Clinical Lab Science/Med-Tech are encouraged to complete the following courses in high school.

Two years of high school algebra **OR**

MATH 1513 College Algebra

Major Requirements

Clinical Lab Science/Med-Tech 87

Students may earn the Bachelor of Science degree in Clinical Lab Science/Med-Tech from the University of Central Oklahoma upon completion of the following three year curriculum and an additional one year in a hospital school approved by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).

Biology and Chemistry 46

Required courses:

BIO 1204 Biology I for Majors

BIO 1225 Biology II for Majors and Lab

BIO 2203 Cell Biology

BIO 2604 Human Physiology and Lab

BIO 3054 Microbiology for Majors and Lab

BIO 3303 Genetics

BIO 3515 Pathogenic Microbiology and Immunology and Lab

CHEM 1103 General Chemistry I

CHEM 1112 General Chemistry I-Recitation/Lab

CHEM 1223 General Chemistry II

CHEM 1232 General Chemistry II-Recitation/Lab

CHEM 3303 Organic Chemistry I

CHEM 3312 Organic Chemistry I Lab

CHEM 3403 Biochemistry I

Mathematics 6

Required courses:

MATH 2153 BioCalculus

STAT 2103 Intro Statistics for Sciences

Elective Biology and/or Chemistry 5

Selected from the following courses:

BIO 3403 Comparative Animal Physiology **OR**

BIO 3464 Comparative Animal Physiology and Lab

BIO 3414 Histology and Lab

BIO 3803 Mammalian Physiology I

BIO 3813 Mammalian Physiology II

BIO 4413 Virology and Lab

BIO 4773 Parasitology and Lab

CHEM 3203 Introductory Physical Chemistry

CHEM 3323 Organic Chemistry II

CHEM 3332 Organic Chemistry II Lab

CHEM 3442 Experimental Biochemistry

CHEM 4103 Biochemistry II

#Medical Technology 30

Students must complete an appropriate one year program with approved affiliate Hospital Medical Technology Program and satisfactorily complete the following courses through the University of Central Oklahoma.

BIO 4117 Clinical Microbiology

BIO 4236 Clinical Hematology

BIO 4246 Clinical Immunology

CHEM 4125 Clinical Chemistry I

CHEM 4325 Clinical Chemistry II

CHEM 4351 Topics in Medical Technology

Electives to bring total to 124

#The Clinical Lab Science/Medical Technology degree can only be obtained upon completion of the one year clinical hospital training. Completion of the three-year requirements at UCO does NOT assure acceptance into one of the three affiliated hospitals. Acceptance into a hospital program is highly competitive.

Minimum Grade Requirements

1. Average in (a) all college course work, (b) course work at UCO, and (c) major courses 2.00
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Computer Science**
 Major: **Computer Science**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Computer Science**
 College: **Mathematics and Science**
 Major Code: **6100**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

• **Written and Oral Communication..... 9**

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis..... 6

Aesthetic Analysis 3

Critical Inquiry..... 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

Required Health Course..... 2

Elective Life Skills..... 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....0-12

Students majoring in Computer Science are encouraged to complete the following courses in high school.

High School Physics **OR**

PHY 1003 Introduction to Physics

Advanced Placement High School Programming Course **OR**

CMSC 1513 Beginning Programming

One year of High School Algebra II and Trigonometry **OR**

MATH 1513 College Algebra **AND**

MATH 1593 Plane Trigonometry **OR**

MATH 1555 College Algebra and Trigonometry

Upon completion of the above courses, corresponding university core requirements will be satisfied. (These courses are required for this major regardless of previous degrees conferred.)

Major Requirements

Computer Science82

Required..... 63

- ^ CMSC 1613 Programming I
- ^ CMSC 2123 Discrete Structures
- ^ CMSC 2613 Programming II
- ^ CMSC 2833 Computer Organization I
- ^ CMSC 3103 Object Oriented Programming
- ^ CMSC 3833 Computer Organization II
- ^ CMSC 3613 Data Structures and Algorithms
- ^ CMSC 4003 Applications Database Management
- ^ CMSC 4023 Programming Languages **OR**
- ^CMSC 4173 Translator Design
- ^ CMSC 4153 Operating Systems
- ^ CMSC 4273 Theory of Computing
- ^ CMSC 4283 Software Engineering
- ^ CMSC 4401 Ethics in Computing
- ^*CMSC 4513 Software Design and Development
- ^ MATH 2313 Calculus 1
- ^ MATH 2323 Calculus 2
- ^ MATH 2333 Calculus 3

- ^ MATH 3143 Linear Algebra
- STAT 3103 Statistical Methods I **OR**
- STAT 4113 Mathematical Statistics I
- PHY 2014 Physics for Scientists & Engineers I and Lab
- PHY 2114 Physics for Scientists & Engineers II and Lab

^ A grade of 'C' or better must be earned in CMSC 1613, 2123, 2613, 2833, 3103, 3613, 3833, 4003, (4023 OR 4173), 4153, 4273, 4283, 4401, 4513 and MATH 2313, 2323, 2333, 3143.

* CMSC 4513 is recommended to be taken in the last semester prior to graduation.

Elective courses 19

A minimum of 13 hours must be 3/4000 level CMSC courses. Up to 6 hours of CMSC electives may be taken at the 2000 level.

No more than four (4) hours of Internship and Individual Study combined may be used to satisfy the CMSC elective requirement.

Credit cannot be received for both CMSC 3303 and 4283.

Electives to bring total to..... 124

Minimum Grade Requirements

Average in (a) all college course work, (b) course work at UCO, and (c) major courses..... 2.00

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Computer Science**
 Major: **Computer Science - Applied**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Computer Science**
 College: **Mathematics and Science**
 Major Code: **6101**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

• **Written and Oral Communication**..... 9

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

Life Science 4

Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis..... 6

Aesthetic Analysis 3

Critical Inquiry..... 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

Required Health Course..... 2

Elective Life Skills..... 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Major Support Courses.....0-9

Students majoring in Computer Science-Applied are encouraged to complete the following courses in high school.

Advanced Placement High School Programming Course **OR**
 CMSC 1513 Beginning Programming

One year of High School Algebra II and Trigonometry **OR**
 MATH 1513 College Algebra **AND**
 MATH 1593 Plane Trigonometry **OR**
 MATH 1555 College Algebra and Trigonometry

Upon completion of the above courses, corresponding university core requirements will be satisfied. (These courses are required for this major regardless of previous degrees conferred.)

Major Requirements

Computer Science - Applied.....54

Required..... 45

- ^ CMSC 1613 Programming I
- ^ CMSC 1713 COBOL **OR**
- ^ CMSC 2413 Visual Programming
- ^ CMSC 2123 Discrete Structures
- ^ CMSC 2613 Programming II
- ^ CMSC 2833 Computer Organization I
- ^ CMSC 3103 Object Oriented Programming
- ^ CMSC 3303 System Analysis and Design **OR**
- ^ CMSC 4283 Software Engineering
- ^ CMSC 3613 Data Structures and Algorithms
- ^ CMSC 4003 Applications Database Management
- ^ CMSC 4023 Programming Languages **OR**
- ^CMSC 4173 Translator Design
- ^ CMSC 4153 Operating Systems
- ^*CMSC 4513 Software Design and Development
- ^ MATH 2313 Calculus 1
- ^ MATH 2323 Calculus 2

- STAT 3103 Statistical Methods I **OR**
- STAT 4113 Mathematical Statistics I

^ A grade of 'C' or better must be earned in CMSC 1613, (1713 OR 2413), 2123, 2613, 2833, 3103, (3303 OR 4283), 3613, 4003, (4023 OR 4173), 4153, 4513 and MATH 2313, 2323.

* CMSC 4513 is recommended to be taken in the last semester prior to graduation.

Elective 3000/4000 level Computer Science course..... 9

No more than three (3) hours of Internship and Individual Study combined may be used to satisfy the CMSC elective requirement.

Credit cannot be received for both CMSC 3303 and 4283.

Minor..... 18

The student will complete a minor; if the student is completing a second Bachelor's degree, the first degree's major will satisfy the requirements for the minor.

OR

Second Major

The student will complete a second major. If any of the courses listed among the 54 hours above is required for the second major, then (subject to academic policy) replacement course(s) will be selected by the Chair of the department in which the student is taking the second major.

Electives to bring total to..... 124

Minimum Grade Requirements

Average in (a) all college course work, (b) course work at UCO, and (c) major courses..... 2.00

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Computer Science**
 Major: **Computer Science - Information Science**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Computer Science**
 College: **Mathematics and Science**
 Major Code: **6102**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

• **Written and Oral Communication..... 9**

Quantitative Reasoning/Scientific Method 10-11

- Math..... 3
- Life Science 4
- Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis..... 6

- Aesthetic Analysis 3
- Critical Inquiry..... 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

- Required Health Course..... 2
- Elective Life Skills 3

**Minimum
Required Hours**

**Support Courses
Major Support Courses.....0-12**

Students majoring in Computer Science-Information Science are encouraged to complete the following courses in high school.

A high school computer technology course using a word processor, spreadsheet, e-mail, browser, and search engines **OR**

CMSC 1053 Professional Computer Applications and Problem Solving

Advanced Placement High School Programming Course **OR**

CMSC 1513 Beginning Programming

One year of High School Algebra II and Trigonometry **OR**

MATH 1513 College Algebra **AND**

MATH 1593 Plane Trigonometry **OR**

MATH 1555 College Algebra and Trigonometry

Upon completion of the above courses, corresponding university core requirements will be satisfied. (These courses are required for this major regardless of previous degrees conferred.)

Major Requirements

Computer Science - Information Science..... 78

Required..... 63

- ^ CMSC 1613 Programming I
- ^ CMSC 1713 COBOL
- ^ CMSC 2123 Discrete Structures
- ^ CMSC 2413 Visual Programming
- ^ CMSC 2613 Programming II
- ^ CMSC 2833 Computer Organization I
- ^ CMSC 3103 Object Oriented Programming
- ^ CMSC 3303 Systems Analysis and Design
- ^ CMSC 3413 Advanced Visual Programming
- ^ CMSC 3613 Data Structures and Algorithms
- ^ CMSC 4003 Applications Database Management
- ^ CMSC 4063 Networks
- ^ CMSC 4153 Operating Systems
- ^* CMSC 4513 Software Design and Development
- ^ MATH 2313 Calculus 1
- ^ MATH 2323 Calculus 2

**Minimum
Required Hours**

- STAT 3103 Statistical Methods I **OR**
- STAT 4113 Mathematical Statistics I
- ACCT 2113 Accounting I
- ACCT 2133 Accounting II
- MGMT 3103 Management and Organizational Behavior
- ISOM 3263 Management Information Systems

^ A grade of 'C' or better must be earned in CMSC 1613, 1713, 2123, 2413, 2613, 2833, 3103, 3303, 3413, 3613, 4003, 4063, 4153, 4513 and MATH 2313, 2323.

* CMSC 4513 is recommended to be taken in the last semester prior to graduation.

Elective 3000/4000 level Computer Science courses 9

No more than three (3) hours of Internship and Individual Study combined may be used to satisfy the CMSC elective requirement.

Credit cannot be received for both CMSC 3303 and 4283.

Other areas of application..... 6

Selected from the following:

- ACCT 3113 Managerial Accounting
- ACCT 3433 Accounting Information Systems
- FIN 3563 Fundamentals of Business Finance
- ISOM 4063 Computer Simulation
- ISOM 4283 Developing Decision Support Systems
- ISOM 4363 Information Systems Management

Electives to bring total to..... 124

Minimum Grade Requirements

Average in (a) all college course work, (b) course work at UCO, and (c) major courses..... 2.00

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Engineering Physics**
 Major: **Engineering Physics - Electrical Systems**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Engineering and Physics**
 College: **Mathematics and Sciences**
 Major Code: **6245**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.
 • Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

- Math 3
- Life Science 4
- Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

• Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis 3

• Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills 3

	Minimum Required Hours
Support Courses	
Support Courses.....9-19	
PHIL 1123 Contemporary Moral Problems	
ECON 1103 Introduction to Economics	
FMKT 2323 Global Protocol and Diversity (or Foreign Language)	

Students majoring in the Engineering Physics program are encouraged to complete the following courses in high school.

- One year of High School Algebra II and Trigonometry **OR**
- MATH 1513 College Algebra **AND**
 - MATH 1593 Plane Trigonometry **OR**
 - MATH 1555 College Algebra and Trigonometry
- One year of high school physics **OR**
- PHY 1003 Introduction to Physics

Major Requirements

Engineering Physics - Electrical Systems93-94

Physics..... 14

Required courses:

- PHY 2014 Physics for Scientists and Engineers I and Lab
- PHY 2114 Physics for Scientists and Engineers II and Lab
- PHY 3103 Modern Physics
- PHY 3883 Mathematical Physics I

Engineering..... 54

Required courses:

- ENGR 1112 Introduction to Engineering and Laboratory
- ENGR 1213 Engineering Computing and Laboratory
- ENGR 2033 Statics
- ENGR 2043 Dynamics
- ENGR 2303 Electrical Science
- ENGR 2311 Electrical Science Laboratory
- ENGR 3183 Electromagnetic Fields I
- ENGR 3203 Thermodynamics
- ENGR 3222 Digital Logic Design and Laboratory
- ENGR 3302 Engineering Statistics and Experimentation
- ENGR 3323 Signals and Systems & Laboratory

	Minimum Required Hours
ENGR 3404 Analog Electronics and Laboratory	
ENGR 3413 Materials Science	
ENGR 3613 Microprocessors and Laboratory	
ENGR 3703 Computational Methods in Engineering	
*ENGR 4323 Digital and Analog Communication	
ENGR 4333 Digital Signal Processing and Laboratory	
*ENGR 4803 Mechatronics & Laboratory	
ENGR 4882 Senior Engineering Design I	
ENGR 4892 Senior Engineering Design II	

Mathematics 14-15

Required courses:

- MATH 2305 Accelerated Calculus 1 and 2 **OR**
- MATH 2313 Calculus 1 **AND**
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 3103 Differential Equations

Chemistry..... 5

Required courses:

- CHEM 1315 Chemistry for Engineering and Lab

Engineering Electives..... 6

Select from the following:

- ENGR 3803 Electrical Power Systems
- *ENGR 4183 Electromagnetic Fields II
- ENGR 4263 Engineering Optics
- ENGR 4303 Control Systems
- *ENGR 4613 Photonics
- *ENGR 4633 Solid State Devices

*Students in the Accelerated BS/MS program in Engineering Physics must enroll in the graduate level versions of this course, and must choose the 5000 level of either Photonics, Electromagnetic Fields II or Solid State Devices as one of the engineering electives. Students need only three 5000-level courses as part of the accelerated program.

The number of credits needed to meet degree requirements exceeds 124 hours and will vary according to course selection.

Program: **Engineering Physics** - continued
Major: **Engineering Physics - Electrical Systems**
Degree: Bachelor of Science (B.S.)

Dept: Engineering and Physics
College: Mathematics and Sciences
Major Code: 6245

- CONTINUED FROM PREVIOUS PAGE -

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO **2.00**
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

This program requires admission to the Upper Division with special requirements. See page 54 of the 2012-2013 catalog for selective admission criteria.

Program: **Engineering Physics**
 Major: **Engineering Physics - Mechanical Systems**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Engineering and Physics**
 College: **Mathematics and Science**
 Major Code: **6244**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

- Math 3
- Life Science 4
- Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

• Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis 3

• Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills 3

**Minimum
Required Hours**

Support Courses

Support Courses 9-19

- PHIL 1123 Contemporary Moral Problems
- ECON 1103 Introduction to Economics
- FMKT 2323 Global Protocol and Diversity
(or Foreign Language)

Students majoring in the Engineering Physics program are encouraged to complete the following courses in high school.

One year of High School Algebra II and Trigonometry **OR**

- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry **OR**
- MATH 1555 College Algebra and Trigonometry

One year of high school physics **OR**

- PHY 1003 Introduction to Physics

Major Requirements

Engineering Physics - Mechanical Systems ...92-94

Physics 14

Required courses:

- PHY 2014 Physics for Scientists and Engineers I and Lab
- PHY 2114 Physics for Scientists and Engineers II and Lab
- PHY 3103 Modern Physics
- PHY 3883 Mathematical Physics I

Engineering 54

Required courses:

- ENGR 1112 Introduction to Engineering and Laboratory
- ENGR 1213 Engineering Computing and Laboratory
- ENGR 2033 Statics
- ENGR 2043 Dynamics
- ENGR 2143 Strength of Materials
- ENGR 2151 Strength of Materials Lab
- ENGR 2303 Electrical Science
- ENGR 2311 Electrical Science Laboratory
- ENGR 3203 Thermodynamics
- ENGR 3302 Engineering Statistics and Experimentation
- ENGR 3323 Signals and Systems & Laboratory
- ENGR 3363 Mechanical Engineering Design
- ENGR 3413 Materials Science

**Minimum
Required Hours**

- ENGR 3443 Fluid Mechanics
- ENGR 3451 Fluid Mechanics Lab
- ENGR 3703 Computational Methods in Engineering
- ENGR 4123 Heat Transfer
- ENGR 4141 Heat Transfer Lab
- *ENGR 4533 Thermal Systems Design
- *ENGR 4803 Mechatronics & Laboratory
- ENGR 4882 Senior Engineering Design I
- ENGR 4892 Senior Engineering Design II

Mathematics 14-15

Required courses:

- MATH 2305 Accelerated Calculus 1 and 2 **OR**
- MATH 2313 Calculus 1 **AND**
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 3103 Differential Equations

Chemistry 5

Required courses:

- CHEM 1315 Chemistry for Engineering and Lab

Physics or Engineering Electives 5-6

Selected from the following:

- ENGR 3222 Digital Logic Design and Laboratory
- ENGR 4103 Finite Element Analysis
- ENGR 4303 Control Systems
- *ENGR 4313 Fluid Dynamics
- *ENGR 4343 Biomechanics
- PHY 4163 Analytical Mechanics

*Students in the Accelerated BS/MS program in Engineering Physics must enroll in the graduate level versions of this course, and must choose the 5000 level of either Fluid Dynamics or Biomechanics as one of the engineering electives. Students need only three 5000-level courses as part of the accelerated program.

Program: **Engineering Physics** - continued
Major: **Engineering Physics - Mechanical Systems**
Degree: Bachelor of Science (B.S.)

Dept: Engineering and Physics
College: Mathematics and Science
Major Code: 6244

- CONTINUED FROM PREVIOUS PAGE -

The number of credits needed to meet degree requirements exceeds 124 hours and will vary according to course selection.

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO **2.00**
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

This program requires admission to the Upper Division with special requirements. See page 54 of the 2012-2013 catalog for selective admission criteria.

Program: **Engineering Physics**
 Major: **Engineering Physics - Physics**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Engineering and Physics**
 College: **Mathematics and Science**
 Major Code: **6243**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

- Math 3
- Life Science 4
- Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

• Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis 3

• Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills 3

**Minimum
Required Hours**

Support Courses

Support Courses 9-19

- PHIL 1123 Contemporary Moral Problems
- ECON 1103 Introduction to Economics
- FMKT 2323 Global Protocol and Diversity
(or Foreign Language)

Students majoring in the Engineering Physics program are encouraged to complete the following courses in high school.

One year of High School Algebra II and Trigonometry **OR**

- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry **OR**
- MATH 1555 College Algebra and Trigonometry

One year of high school physics **OR**

- PHY 1003 Introduction to Physics

Major Requirements

Engineering Physics - Physics 95-96

Physics 23

Required courses:

- PHY 2014 Physics for Scientists and Engineers I and Lab
- PHY 2114 Physics for Scientists and Engineers II and Lab
- PHY 3103 Modern Physics
- PHY 3883 Mathematical Physics I
- PHY 4003 Mathematical Physics II
- *PHY 4163 Analytical Mechanics **OR**
- *ENGR 4183 Electromagnetic Fields II
- *PHY 4173 Classical Mechanics **OR**
- *PHY 4203 Quantum Mechanics

Engineering 49

Required courses:

- ENGR 1112 Introduction to Engineering and Laboratory
- ENGR 1213 Engineering Computing and Laboratory
- ENGR 2033 Statics
- ENGR 2043 Dynamics
- ENGR 2143 Strength of Materials
- ENGR 2303 Electrical Science
- ENGR 2311 Electrical Science Laboratory

**Minimum
Required Hours**

- ENGR 3183 Electromagnetic Fields I
- ENGR 3203 Thermodynamics
- ENGR 4263 Engineering Optics
- ENGR 3302 Engineering Statistics and Experimentation
- ENGR 3323 Signals and Systems & Laboratory
- ENGR 3404 Analog Electronics and Laboratory
- ENGR 3443 Fluid Mechanics
- ENGR 3703 Computational Methods in Engineering
- *ENGR 4633 Solid State Devices
- ENGR 4882 Senior Engineering Design I
- ENGR 4892 Senior Engineering Design II

Mathematics 14-15

Required courses:

- MATH 2305 Accelerated Calculus 1 and 2 **OR**
- MATH 2313 Calculus 1 **AND**
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 3103 Differential Equations

Chemistry 5

Required courses:

- CHEM 1315 Chemistry for Engineering and Lab

Physics or Engineering Electives 4

Any 3000 or 4000 level PHY or ENGR course with the following exceptions: PHY 3014, PHY 3044, PHY 3054, or PHY 3503.

*Students in the Accelerated BS/MS program in Engineering Physics must enroll in the graduate level versions of this course. Students need only three 5000-level courses as part of the accelerated program.

The number of credits needed to meet degree requirements exceeds 124 hours and will vary according to course selection.

Program: **Engineering Physics** - continued
Major: **Engineering Physics - Physics**
Degree: Bachelor of Science (B.S.)

Dept: Engineering and Physics
College: Mathematics and Science
Major Code: 6243

- CONTINUED FROM PREVIOUS PAGE -

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO **2.00**
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

This program requires admission to the Upper Division with special requirements. See page 54 of the 2012-2013 catalog for selective admission criteria.

Program: **Funeral Service**
 Major: **Funeral Service**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Funeral Service**
 College: **Mathematics and Science**
 Major Code: **6120**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

Math 3

Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2

• Elective Life Skills 3

Minimum
Required Hours

Major Requirements

Funeral Service 67

Required Course 5

ACCT 2223 Survey of Accounting OR

ACCT 2113 Accounting I

* FNRL 4522 Board Review

Basic Sciences 15

Required courses:

BIO 2314 Introduction to Microbiology and Lab

CHEM 1014 Introduction to Chemistry and Lab

FNRL 2214 Introduction to Human Anatomy and Dissection

FNRL 3433 Introduction to Pathology

Mortuary Arts and Sciences 20

Required courses:

FNRL 3054 Embalming Chemistry

FNRL 3204 Embalming

FNRL 3304 Restorative Art

* FNRL 4118 Practicum in Embalming & Funeral Directing

Mortuary Administration 27

Required courses:

FNRL 1211 Orientation to Funeral Service

FNRL 2313 Contemporary Funeral Service

FNRL 3374 Funeral Home Management I

FNRL 3383 Funeral Service Statutory Law

FNRL 3393 Mortuary Jurisprudence

FNRL 3493 Funeral Service Communication

FNRL 3513 History of Funeral Directing

FNRL 4214 Funeral Home Management II

FNRL 3483 Psychology of Grief

* Must be taken concurrently during a student's final semester.

Electives to bring total to 124

Minimum Grade Requirements

1. Average in (a) all college course work, (b) course work at UCO, and (c) major courses 2.00

2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

The American Board of Funeral Service Education (ABFSE), the national accreditation agency for all schools of mortuary education, has implemented a new criterion for all graduates. As of January 2004, all graduating seniors must take the National Board Examination as a requirement for the B.S. in Funeral Service. The annual passage rate of first-time takers on the National Board Examination (NBE) for the most recent three-year period for this institution and all ABFSE accredited funeral service education programs is posted on the ABFSE website (www.abfse.org).

The Department of Funeral Service Bachelor of Science Degree and Certificate of Completion Programs at the University of Central Oklahoma are accredited by the American Board of Funeral Service Education (ABFSE) 3414 Ashland Avenue, Suite G, St. Joseph, Missouri 64506 (816)233-3747 www.abfse.org.

The Department of Funeral Service has as its central aim recognition of the importance of funeral service education personnel as:

1. Members of a human services profession.
2. Members of the community in which they serve.
3. Participants in the relationship between bereaved families and those engaged in the funeral service profession.
4. Professionals knowledgeable of and compliant with federal, state, provincial/territorial, and local regulatory guidelines (in the geographic area where they practice).
5. Professionals sensitive to the responsibility for public health, safety, and welfare in caring for human remains.

Department of Funeral Service Objectives

1. To enlarge the background and knowledge of students about the funeral service profession.
2. To educate students in every phase of funeral service and to help enable them to develop proficiency and skills necessary for the profession, as defined in the Preamble above.
3. To educate students concerning the responsibilities of the funeral service progression to the community at large.
4. To emphasize high standards of ethical conduct.
5. To provide a curriculum at the post-secondary level of instruction.
6. To encourage student and faculty research in the field of funeral service.

Admission to this program has special requirements. See page 54 of the 2012-2013 catalog for selective admission criteria.

Program: **Mathematics**
 Major: **Mathematics**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Mathematics and Statistics**
 College: **Mathematics and Science**
 Major Code: **6160**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

- Math 3
- Life Science 4
- Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills 3

**Minimum
Required Hours**

Prerequisite Courses

Prerequisite Courses 0-6

- MATH 1513 College Algebra or High School Algebra II **AND**
- MATH 1593 Plane Trigonometry or High School Trigonometry
- OR**
- MATH 1555 College Algebra and Trigonometry or the equivalent of these courses at other institutions.

Upon completion of the above courses, corresponding general education requirements will be satisfied. (These courses are required for this major regardless of previous degrees conferred.)

Major Requirements

Mathematics 47

Required 30

- MATH 1643 Introduction to Engineering with Computer Applications **OR**
- MATH 1743 Technology and Mathematics
- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 3113 Foundations of Advanced Math
- MATH 3143 Linear Algebra
- MATH 3183 Introduction to Modern Algebra
- MATH 4143 Introduction to Analysis 1
- STAT 4113 Mathematical Statistics I

Electives 17

At least nine (9) hours must be selected from the following:

- MATH 3103 Differential Equations
- MATH 3163 Elementary Number Theory
- MATH 4153 Introduction to Analysis 2
- MATH 4483 History of Mathematics
- STAT 4123 Mathematical Statistics II

All other elective courses must be selected from 3000 and 4000 level MATH courses (including those MATH courses listed above).

Electives to bring total to 124

It is strongly recommended that PHY 1114 General Physics I and Lab be taken in the general education pattern.

Minimum Grade Requirements

1. Average in (a) all college course work, (b) course work at UCO, and (c) major courses 2.50
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Mathematics**
 Major: **Mathematics - Applied Mathematics**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Mathematics and Statistics**
 College: **Mathematics and Science**
 Major Code: **6161**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

• Math 3
 Life Science 4
 Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3
 Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3
 American History 3

Cultural and Language Analysis 3-4

Second Language 4
 OR
 Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2
 Elective Life Skills 3

**Minimum
 Required Hours**

Prerequisite Courses

Prerequisite Courses 0-6

MATH 1513 College Algebra or High School Algebra II AND
 MATH 1593 Plane Trigonometry or High School Trigonometry
 OR
 MATH 1555 College Algebra and Trigonometry or the
 equivalent of these courses at other institutions.

Upon completion of the above courses, corresponding general education requirements will be satisfied. (These courses are required for this major regardless of previous degrees conferred.)

Major Requirements

Mathematics - Applied Mathematics 47

Required courses 27

MATH 1643 Introduction to Engineering with Computer
 Applications OR
 MATH 1743 Technology and Mathematics
 MATH 2313 Calculus 1
 MATH 2323 Calculus 2
 MATH 2333 Calculus 3
 MATH 2343 Calculus 4
 MATH 3113 Foundations of Advanced Math
 MATH 3143 Linear Algebra
 MATH 3183 Introduction to Modern Algebra
 MATH 4143 Introduction to Analysis 1

Applied Mathematics 20

Required courses:

MATH 3103 Differential Equations
 MATH 3263 Numerical Analysis I
 MATH 4113 Introduction to Operations Research I
 STAT 3103 Statistical Methods I
 STAT 4113 Mathematical Statistics I
 Any 3000 and 4000 level MATH or STAT course

Electives to bring total to 124

It is strongly recommended that PHY 1114 General Physics I and Lab be taken in the general education pattern.

Minimum Grade Requirements

1. Average in (a) all college course work, (b) course work at UCO, and (c) major courses 2.50
2. A minimum grade of "C" must be earned in all courses in the major to count toward meeting degree requirements.

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Mathematics**
 Major: **Mathematics - Statistics**
 Degree: **Bachelor of Science (B.S.)**

Dept: **Mathematics and Statistics**
 College: **Mathematics and Science**
 Major Code: **6162**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.
 • Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11
 • Math..... 3
 Life Science 4
 Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis 6
 Aesthetic Analysis 3
 Critical Inquiry..... 3

American Historical and Political Analysis 6
 American National Government 3
 American History 3

Cultural and Language Analysis 3-4
 Second Language 4
 OR
 Cultural Analysis..... 3

Social and Behavioral Analysis 3

Life Skills 5
 Required Health Course 2
 Elective Life Skills..... 3

**Minimum
Required Hours**

Prerequisite Courses
Prerequisite Courses 0-6

- MATH 1513 College Algebra or High School Algebra II **AND**
- MATH 1593 Plane Trigonometry or High School Trigonometry
- OR**
- MATH 1555 College Algebra and Trigonometry or the equivalent of these courses at other institutions.

Upon completion of the above courses, corresponding general education requirements will be satisfied. (These courses are required for this major regardless of previous degrees conferred.)

Major Requirements

Mathematics - Statistics..... 54
The following courses 30
 Required..... 27
 CMSC 1513 Beginning Programming
 MATH 2313 Calculus 1
 MATH 2323 Calculus 2
 MATH 2333 Calculus 3
 MATH 2343 Calculus 4
 MATH 3103 Differential Equations
 MATH 3113 Foundations of Advanced Math
 MATH 3143 Linear Algebra
 MATH 3183 Introduction to Modern Algebra
 Electives..... 3
 Selected from 3000 and 4000 level MATH courses.

Statistics 24
 Required Courses:
 STAT 3103 Statistical Methods I
 STAT 4103 Applied Experimental Design
 STAT 4113 Mathematical Statistics I
 STAT 4123 Mathematical Statistics II
 STAT 4213 Applied Regression Analysis
 STAT 4253 Computer Applications in Statistics
 STAT 4313 Nonparametric Statistics
 STAT 4513 Statistical Consulting

**Minimum
Required Hours**

Electives to bring total to..... 124

Minimum Grade Requirements

1. **Average in (a) all college course work, (b) course work at UCO, and (c) major courses 2.50**
2. **A minimum grade of “C” must be earned in all courses in the major to count toward meeting degree requirements.**

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Mathematics Education**
 Major: **Mathematics Education**
 Degree: **Bachelor of Science in Education (B.S.Ed.)**

Dept: **Mathematics and Statistics**
 College: **Mathematics and Science**
 Major Code: **6180**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

• **Written and Oral Communication..... 9**

Quantitative Reasoning/Scientific Method 10-11

- Math..... 3
- Life Science 4
- Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis..... 6

- Aesthetic Analysis 3
- Critical Inquiry..... 3

American Historical and Political Analysis 6

- American National Government 3
- American History..... 3

Cultural and Language Analysis 3-4

- Second Language..... 4
- OR
- Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

- Required Health Course..... 2
- Elective Life Skills 3

**Minimum
Required Hours**

Support and Prerequisite Courses

Support Courses..... 9

- MCOM 2023 Communication for Teachers
- ENG 1113 English Composition
- ENG 1213 English Composition and Research

Prerequisite Courses..... 0-6

- MATH 1513 College Algebra or High School Algebra II **AND**
- MATH 1593 Plane Trigonometry or High School Trigonometry
- OR**
- MATH 1555 College Algebra and Trigonometry or the equivalent of these courses at other institutions.

Major Requirements

Mathematics Education..... 41-42

Required courses 39

- MATH 1743 Technology and Mathematics
- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 3113 Foundations of Advanced Mathematics
- MATH 3123 College Geometry
- MATH 3143 Linear Algebra
- MATH 3163 Elementary Number Theory
- MATH 3183 Introduction to Modern Algebra
- MATH 4483 History of Mathematics
- STAT 3103 Statistical Methods I
- STAT 4113 Mathematical Statistics I

Mathematics Electives 2-3

Select at least one of the following:

- MATH 3103 Differential Equations
- MATH 4143 Introduction to Analysis 1
- MATH 4960 Institute in Mathematics (2 hours)

**Minimum
Required Hours**

Professional Education 31

- PTE 3023 Foundations of American Education/Field Exp
- PTE 3153 Adolescent Psychology
- SPED 4123 Teaching Individuals with Disabilities
- IME 3312 Technology for Teachers
- ^MATH 4843 Teaching Secondary Mathematics
- ^PTE 4172 Educational Assessment
- ^PTE 4533 Educational Psych/Field Experience
- ^#PTE 4811 Contemporary Issues
- ^#PTE 4838 Student Teaching Secondary
- ^#PTE 4853 Classroom Management & Instruction

^ Admission to Teacher Education required
 #To be taken the same semester

Electives to bring total to..... 124

It is strongly recommended that students complete a two-semester sequence in physics (PHY 1114/1214 - General Physics I/II and laboratory) or computer science (CMSC 1613/2613 - Programming I/II). Students planning to do graduate work should take MATH 4143, Introduction to Analysis 1.

Minimum Graduation Requirements

1. Overall GPA in all college course work 2.75
2. In courses in English Composition, Professional Education, and area of specialization (major) "C"
3. Proficiency in foreign language Novice 4 level

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Nursing**
 Major: **Nursing**
 Degree: Bachelor of Science (B.S.)

Dept: Nursing
 College: Mathematics and Science
 Major Code: 6200

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

Math 3

• Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

• Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

• **Social and Behavioral Analysis..... 3**

Life Skills 5

Required Health Course 2

• Elective Life Skills 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Major Requirements

Nursing..... 98

The UCO nursing program is accredited by the **National League for Nursing Accrediting Commission and approved by the Oklahoma Board of Nursing. Graduates of this state approved program are eligible to apply to write the National Council Licensure Examination (NCLEX) for registered nurses.

Pre-Professional 39

The following courses:

- CHEM 1014 Introductory Chemistry and Lab
- BIO 1114 General Biology **OR**
- BIO 1204 Biology I for Majors
- NTRN 1513 Introduction to Nutrition
- PSY 1103 General Psychology
- SOC 2103 Sociology
- BIO 2314 Introductory Microbiology and Lab
- BIO 2504 Human Anatomy and Lab **OR**
- FNRL 2214 Elementary Human Anatomy and Dissection
- BIO 2604 Human Physiology and Lab
- ECON 2173 Principles of Business Statistics **OR**
- PSY 2753 Psychological Statistics **OR**
- SOC 4043 Sociological Statistics **OR**
- STAT 3103 Statistical Methods I **OR**
- ECON 2303 Statistics for Healthcare **OR**
- STAT 2103 Introduction to Statistics for Sciences
- PHIL 1103 Logic and Critical Thinking **OR**
- PHIL 1113 Introduction to Philosophy **OR**
- PHIL 1123 Contemporary Moral Problems **OR**
- PHIL 2073 Social & Political Philosophy
- NURS 1221 Introduction to Nursing
- NURS 2113 Individual and Family Development Through the Lifespan

Professional..... 59

The following courses:

- NURS 2207 Foundations of Nursing
- NURS 3202 Introduction to Pharmacology
- NURS 3307 Adult Medical-Surgical Nursing I
- NURS 3314 Maternal-Newborn Nursing

- NURS 3324 Pediatric/Child Health Nursing
- NURS 3333 Psychiatric/Mental Health Nursing
- NURS 3344 Adult Med/Surg Nursing II
- NURS 3512 Service Learning and Health Promotion
- NURS 4134 Community Health Nursing
- NURS 4146 High Acuity Nursing
- NURS 4153 Research/Evidence-Based Practice
- NURS 4324 Care of Vulnerable Individuals
- NURS 4722 Pharmacology II
- NURS 4746 Professional Nursing Leadership & Management
- NURS 4821 Preparing for Entry into Practice

The number of credits needed to meet degree requirements may exceed 124 hours and will vary according to course selection.

- CONTINUED ON NEXT PAGE -

Program: **Nursing** - continued
 Major: **Nursing**
 Degree: Bachelor of Science (B.S.)

Dept: Nursing
 College: Mathematics and Science
 Major Code: 6200

- CONTINUED FROM PREVIOUS PAGE -

Admission to Nursing Program

Students planning to become candidates for the Bachelor of Science with a major in Nursing are required to make formal application to the Chairperson of the Department of Nursing for admission into the Professional Nursing program. Applications must be submitted to the Department of Nursing on or before the **last Friday of January for fall admission, and the second Friday of September for spring admission** into the program.

Admission is competitive as applications exceed the number of positions available. Formal approval by the selection committee is required for admission. Preference is given to University of Central Oklahoma students. The student will be notified eight to ten weeks after the filing date as to the disposition of the application.

The following must be submitted to the Department of Nursing as part of the admission process and are used by the faculty in selection of candidates:

- A. Transcript(s) reflecting a minimum retentive grade point average of 2.50 in all course work completed at the time of the application.
- B. A minimum grade of "C" in chemistry, all biological sciences, NURS 1221 and NURS 2113 is required. Two of the five required science courses must be successfully completed prior to the application deadline. Students may enroll a maximum of two times in any nursing course.
- C. Provide references by three professors under whom the student has had recent instruction.
- D. Score on the Test of Essential Academic Skills (TEAS).
- E. Submit a criminal background check (OSBI).
- F. Meet "Performance Standards for Admission and Progression in the Department of Nursing" (available in application packet).
- G. International students (i.e. students for whom English is a second language regardless of resident status) must have a minimum TOEFL score of 530 on the written examination or equivalent on computer or internet version.

Career Ladder Students

RN to BS

Registered nurses who have graduated from an NLNAC accredited associate degree program may be eligible for matriculation into the program on an advanced standing basis. For information regarding criteria and application, go to <http://www.uco.edu/cms/nursing/index.asp>, or contact the Department of Nursing.

LPN to BS

Licensed practical nurses who have graduated from an Oklahoma Career Technology program or an NLNAC accredited practical nursing program may be eligible for matriculation into the program on an advanced standing basis. For information regarding criteria and application, go to <http://www.uco.edu/cms/nursing/index.asp>, or contact the Department of Nursing.

Transfer Students

Students transferring to the University of Central Oklahoma from other institutions are expected to fulfill all requirements specified for regularly enrolled students. The three lower division nursing courses (NURS 1221 - Introduction to Nursing, NURS 2207 - Foundations of Nursing, and NURS 2113 - Individual and Family Development Through the Lifespan must be completed at UCO before entering the junior year of nursing. Call the Department of Nursing for detailed information.

Progression in the Program

- A. To continue in the Nursing Program, candidates must show evidence of satisfactory progress toward graduation and comply with all requirements as indicated in the UCO Undergraduate Catalog, UCO Student Handbook, and the Department of Nursing Student Handbook.
- B. Nursing courses (after admission to the program) will begin with NURS 2207. NURS 1221 and NURS 2113 may be taken prior to, or concurrently with NURS 2207. All university core and pre-professional courses must be successfully completed prior to beginning Upper Division (3000 level) nursing courses.

A minimum grade of "C" must be obtained in all professional courses.

Other Requirements

- A. Transportation to the clinical area and to other special assignments is the responsibility of each student;
- B. Professional liability insurance is required of all students for the duration of the program. Information is available from the Department of Nursing;
- C. Additional expenses for the nursing major include such items as uniforms, equipment, and fees for achievement tests;
- D. Documentation of immunizations: see UCO Department of Nursing Student Handbook for required immunizations;
- E. Current CPR Certification as an American Heart Association Health Care Provider.
- F. A criminal background check (Federal).
- G. Drug screening.

**National League for Nursing Accrediting Commission
 3343 Peachtree Road NE
 Suite 500
 Atlanta, GA 30326
 Phone: 404-975-5000
 Fax: 404-975-5020
 Website: www.nlnac.org

Program: **Science Education**
 Major: **Science Education - Biology**
 Degree: **Bachelor of Science in Education (B.S.Ed.)**

Dept: **Biology**
 College: **Mathematics and Science**
 Major Code: **6040**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

• **Written and Oral Communication..... 9**

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

• Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis..... 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

Required Health Course..... 2

• Elective Life Skills 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....9-15

- MCOM 1113 Fundamentals of Speech
- ENG 1113 English Composition
- ENG 1213 English Composition and Research

Students majoring in the Biology Education program are encouraged to complete the following courses in high school.

Two years of high school Algebra and one year of Trigonometry **OR**

- MATH 1513 College Algebra **OR**
- MATH 1593 Plane Trigonometry

Major Requirements

Science Education - Biology 65

Biology..... 25

Required courses:

- BIO 1204 Biology I for Majors
- BIO 1225 Biology II for Majors and Lab
- BIO 2203 Cell Biology
- BIO 3054 Microbiology for Majors and Lab
- BIO 3303 Genetics
- BIO 3543 General Ecology
- BIO 3703 Evolution

Chemistry..... 10

Required courses:

- CHEM 1103 General Chemistry I **AND**
- CHEM 1112 General Chemistry I Recitation/Lab
- CHEM 1223 General Chemistry II **AND**
- CHEM 1232 General Chemistry II Recitation/Lab

Physics..... 8

Required courses:

- PHY 1114 General Physics I and Lab **OR**
- PHY 2014 Physics for Scientists and Engineers I and Lab
- PHY 1214 General Physics II and Lab **OR**
- PHY 2114 Physics for Scientists and Engineers II and Lab

Mathematics 6

Required courses:

- MATH 2153 BioCalculus
- STAT 2103 Introduction to Statistics for Sciences

Elective 3000/4000 Biology 16

Any 3000/4000 level BIO course

No more than two (2) hours of the following courses will count toward the minimum required hours for the Biology major.

- BIO 2000 Topics in Biology (1-4 hours)
- BIO 3000 Workshops (1-6 hours)
- BIO 3990 Advanced Topics in Biology (1-4 hours)
- BIO 4900 Practicum in Biology (1-4 hours)
- BIO 4930 Individual Study in Biology (1-4 hours)
- BIO 4950 Internship in Biology (1-8 hours)
- BIO 4960 Institute in Biology (1-8 hours)
- BIO 4970 Study Tour in Biology (1-2 hours)

Professional Education 31

- PTE 3023 Foundations of American Education/Field Exp
- PTE 3153 Adolescent Psychology
- SPED 4123 Teaching Individuals with Disabilities
- IME 3312 Technology for Teachers
- ^BIO 4853 General Methods of Teaching Science and Lab
- ^PTE 4172 Educational Assessment
- ^PTE 4533 Educational Psych/Field Experience
- ^#PTE 4811 Contemporary Issues
- ^#PTE 4838 Student Teaching Secondary
- ^#PTE 4853 Classroom Management & Instruction

^ Admission to Teacher Education required

#To be taken the same semester

The number of credits needed to meet degree requirements exceeds 124 hours and will vary according to course selection.

Graduating seniors must take a national assessment exam in Biology as a degree requirement for the B.S.Ed. in Science Education - Biology.

Program: **Science Education** - continued
Major: **Science Education - Biology**
Degree: Bachelor of Science in Education (B.S.Ed.)

Dept: Biology
College: Mathematics and Science
Major Code: 6040

- CONTINUED FROM PREVIOUS PAGE -

Minimum Graduation Requirements

1. Overall GPA in all college course work 2.75
2. In courses in English Composition, Professional Education,
and area of specialization (major) "C"
3. Proficiency in foreign language Novice 4 level

**For other regulations pertaining to graduation, see
pages 63-64 of the 2012-2013 catalog.**

Program: **Science Education**
 Major: **Science Education - Chemistry**
 Degree: **Bachelor of Science in Education (B.S.Ed.)**

Dept: **Chemistry**
 College: **Mathematics and Science**
 Major Code: **6041**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

• **Written and Oral Communication..... 9**

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

• Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis..... 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

Required Health Course..... 2

• Elective Life Skills 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....9-15

- MCOM 1113 Fundamentals of Speech
- ENG 1113 English Composition
- ENG 1213 English Composition and Research

Students majoring in the Chemistry Education program are encouraged to complete the following courses in high school.

Two years of high school Algebra and one year of Trigonometry **OR**

MATH 1513 College Algebra **OR**

MATH 1593 Plane Trigonometry

Major Requirements

Science Education - Chemistry 65

Science Education Core 37

Biology 9

Required courses:

- BIO 1204 Biology I for Majors
- BIO 1225 Biology II for Majors and Lab

Chemistry..... 10

Required courses:

- CHEM 1103 General Chemistry I **AND**
- CHEM 1112 General Chemistry I Recitation/Lab
- CHEM 1223 General Chemistry II **AND**
- CHEM 1232 General Chemistry II Recitation/Lab

Physics 8

Required courses:

- PHY 1114 General Physics I and Lab **OR**
- PHY 2014 Physics for Scientists and Engineers I and Lab
- PHY 1214 General Physics II and Lab **OR**
- PHY 2114 Physics for Scientists and Engineers II and Lab

Earth Science 4

PHY 3014 Earth Science

History and Nature of Science..... 3

BIO 4103 History and Nature of Science

Mathematics..... 3

STAT 2103 Introduction to Statistics for Sciences

Science Education - Chemistry 28

Required Courses 18

- CHEM 2104 Quantitative Analysis and Lab
- CHEM 3303 Organic Chemistry I
- CHEM 3312 Organic Chemistry I Lab
- CHEM 3323 Organic Chemistry II
- CHEM 3203 Introduction to Physical Chemistry
- CHEM 3403 Biochemistry I

Elective Courses..... 10

Any 3/4000 level Biology, Chemistry, Physics or Math courses

Professional Education 31

- PTE 3023 Foundations of American Education/Field Exp
- PTE 3153 Adolescent Psychology
- SPED 4123 Teaching Individuals with Disabilities
- IME 3312 Technology for Teachers
- ^BIO 4853 General Methods of Teaching Science & Lab
- ^PTE 4172 Educational Assessment
- ^PTE 4533 Educational Psych/Field Experience
- ^#PTE 4811 Contemporary Issues
- ^#PTE 4838 Student Teaching Secondary
- ^#PTE 4853 Classroom Management & Instruction

^ Admission to Teacher Education required

#To be taken the same semester

The number of credits needed to meet degree requirements exceeds 124 hours and will vary according to course selection.

Minimum Graduation Requirements

1. Overall GPA in all college course work 2.75
2. In courses in English Composition, Professional Education, and area of specialization (major) "C"
3. Proficiency in foreign language Novice 4 level

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Science Education**
 Major: **Science Education - General Science**
 Degree: **Bachelor of Science in Education (B.S.Ed.)**

Dept: **Biology**
 College: **Mathematics and Science**
 Major Code: **6042**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

• **Written and Oral Communication**..... 9

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

• Life Science..... 4

• Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis..... 6

Aesthetic Analysis..... 3

Critical Inquiry..... 3

American Historical and Political Analysis 6

American National Government..... 3

American History..... 3

Cultural and Language Analysis 3-4

Second Language..... 4

OR

Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

Required Health Course..... 2

• Elective Life Skills..... 3

Minimum
Required Hours

Minimum
Required Hours

Support Courses

Support Courses.....9-15

MCOM 1113 Fundamentals of Speech

ENG 1113 English Composition

ENG 1213 English Composition and Research

Students majoring in the General Science Education program are encouraged to complete the following courses in high school.

Two years of high school Algebra and one year of Trigonometry **OR**

MATH 1513 College Algebra **OR**

MATH 1593 Plane Trigonometry

Major Requirements

Science Education - General Science.....63-64

Science Education Core..... 34

Biology..... 9

Required courses:

BIO 1204 Biology I for Majors

BIO 1225 Biology II for Majors and Lab

Chemistry..... 10

Required courses:

CHEM 1103 General Chemistry I **AND**

CHEM 1112 General Chemistry I Recitation/Lab

CHEM 1223 General Chemistry II **AND**

CHEM 1232 General Chemistry II Recitation/Lab

Physics..... 8

Required courses:

PHY 1114 General Physics I and Lab **OR**

PHY 2014 Physics for Scientists and Engineers I and Lab

PHY 1214 General Physics II and Lab **OR**

PHY 2114 Physics for Scientists and Engineers II and Lab

Mathematics..... 3

Required course:

STAT 2103 Introduction to Statistics for Sciences

Earth Science..... 4

Required course:

PHY 3014 Earth Science

Science Education - General Science..... 28-29

Required courses:

BIO 2203 Cell Biology

BIO 3054 Microbiology for Majors and Lab

BIO 3543 General Ecology

BIO 3703 Evolution

CHEM 2104 Quantitative Analysis and Lab

CHEM 3303 Organic Chemistry I

CHEM 3312 Organic Chemistry I Lab

PHY 3503 Elementary Meteorology

Choose from one of the following:

PHY 1003 Introduction to Physics

PHY 1304 Descriptive Astronomy

PHY 3054 Introduction to Modern Physics & Lab

PHY 3103 Modern Physics

Professional Education31

PTE 3023 Foundations of American Education/Field Exp

PTE 3153 Adolescent Psychology

SPED 4123 Teaching Individuals with Disabilities

IME 3312 Technology for Teachers

^BIO 4853 General Methods of Teaching Science and Lab

^PTE 4172 Educational Assessment

^PTE 4533 Educational Psych/Field Experience

^#PTE 4811 Contemporary Issues

^#PTE 4838 Student Teaching Secondary

^#PTE 4853 Classroom Management & Instruction

^ Admission to Teacher Education required

#To be taken the same semester

- CONTINUED ON NEXT PAGE -

Program: **Science Education** - continued
Major: **Science Education - General Science**
Degree: Bachelor of Science in Education (B.S.Ed.)

Dept: Biology
College: Mathematics and Science
Major Code: 6042

- CONTINUED FROM PREVIOUS PAGE -

The number of credits needed to meet degree requirements exceeds 124 hours and will vary according to course selection.

Minimum Graduation Requirements

1. Overall GPA in all college course work 2.75
2. In courses in English Composition, Professional Education, and area of specialization (major) "C"
3. Proficiency in foreign language Novice 4 level

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Science Education**
 Major: **Science Education - Physical Science**
 Degree: **Bachelor of Science in Education (B.S.Ed.)**

Dept: **Engineering and Physics**
 College: **Mathematics and Science**
 Major Code: **6043**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

• **Written and Oral Communication**..... 9

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

• Life Science..... 4

• Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis..... 6

Aesthetic Analysis..... 3

Critical Inquiry..... 3

American Historical and Political Analysis 6

American National Government..... 3

American History..... 3

Cultural and Language Analysis 3-4

Second Language..... 4

OR

Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

Required Health Course..... 2

• Elective Life Skills..... 3

Minimum
Required Hours

Minimum
Required Hours

Support Courses

Support Courses.....9-15

MCOM 1113 Fundamentals of Speech

ENG 1113 English Composition

ENG 1213 English Composition and Research

Students majoring in the Physical Science Education program are encouraged to complete the following courses in high school.

Two years of high school Algebra and one year of Trigonometry **OR**

MATH 1513 College Algebra **OR**

MATH 1593 Plane Trigonometry

Major Requirements

Science Education - Physical Science 65

Science Education Core..... 37

Biology..... 9

Required courses:

BIO 1204 Biology I for Majors

BIO 1225 Biology II for Majors and Lab

Chemistry..... 10

Required courses:

CHEM 1103 General Chemistry I **AND**

CHEM 1112 General Chemistry I Recitation/Lab

CHEM 1223 General Chemistry II **AND**

CHEM 1232 General Chemistry II Recitation/Lab

Physics..... 8

Required courses:

PHY 1114 General Physics I and Lab **OR**

PHY 2014 Physics for Scientists and Engineers I and Lab

PHY 1214 General Physics II and Lab **OR**

PHY 2114 Physics for Scientists and Engineers II and Lab

Earth Science..... 4

Required course:

PHY 3014 Earth Science

Mathematics..... 3

Required course:

STAT 2103 Introduction to Statistics for Sciences

History and Nature of Science..... 3

Required course:

BIO 4103 History and Nature of Science

Science Education - Physical Science 28

Required courses..... 21

CHEM 2104 Quantitative Analysis and Lab

CHEM 3303 Organic Chemistry I

CHEM 3312 Organic Chemistry I Lab

PHY 1003 Introduction to Physics

PHY 1304 Descriptive Astronomy

PHY 3503 Elementary Meteorology

ENGR 1112 Introduction to Engineering and Lab

Elective Science..... 7

Select from the following:

CHEM 3323 Organic Chemistry II

CHEM 3203 Introductory Physical Chemistry

ENGR 2303 Electrical Science

ENGR 2311 Electrical Science Lab

ENGR 3263 Introduction to Engineering Optics

ENGR 3404 Analog Electronics and Lab

PHY 3044 Medical Physics and Lab

PHY 3103 Modern Physics

PHY 4910 Seminar in Physics (1 - 3 hours)

Professional Education 31

PTE 3023 Foundations of American Education/Field Exp

PTE 3153 Adolescent Psychology

SPED 4123 Teaching Individuals with Disabilities

IME 3312 Technology for Teachers

^BIO 4853 General Methods of Teaching Science and Lab

^PTE 4172 Educational Assessment

^PTE 4533 Educational Psych/Field Experience

^#PTE 4811 Contemporary Issues

^#PTE 4838 Student Teaching Secondary

^#PTE 4853 Classroom Management & Instruction

- CONTINUED ON NEXT PAGE -

Program: **Science Education** - continued
Major: **Science Education - Physical Science**
Degree: Bachelor of Science in Education (B.S.Ed.)

Dept: Engineering and Physics
College: Mathematics and Science
Major Code: 6043

- CONTINUED FROM PREVIOUS PAGE -

^ Admission to Teacher Education required
#To be taken the same semester

The number of credits needed to meet degree requirements exceeds 124 hours and will vary according to course selection.

Minimum Graduation Requirements

1. Overall GPA in all college course work 2.75
2. In courses in English Composition, Professional Education, and area of specialization (major) "C"
3. Proficiency in foreign language Novice 4 level

For other regulations pertaining to graduation, see pages 63-64 of the 2012-2013 catalog.

Program: **Science Education**
 Major: **Science Education - Physics**
 Degree: **Bachelor of Science in Education (B.S.Ed.)**

Dept: **Engineering and Physics**
 College: **Mathematics and Science**
 Major Code: **6044**

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 91-92.

• Courses from the major may apply to the areas marked in the University Core.

• **Written and Oral Communication..... 9**

Quantitative Reasoning/Scientific Method 10-11

- Math..... 3
- Life Science..... 4
- Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis..... 6

- Aesthetic Analysis..... 3
- Critical Inquiry..... 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

- Second Language..... 4
- OR
- Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

- Required Health Course..... 2
- Elective Life Skills 3

**Minimum
Required Hours**

Support Courses

Support Courses.....14-15

- MCOM 2023 Communication for Teachers
- ENG 1113 English Composition
- ENG 1213 English Composition and Research
- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry **OR**
- MATH 1555 College Algebra and Trigonometry **OR**
High School Equivalent

Major Requirements

Science Education - Physics60-61

Science Education Core..... 34

Biology 9

Required courses:

- BIO 1204 Biology I for Majors
- BIO 1225 Biology II for Majors

Chemistry..... 10

Required courses:

- CHEM 1103 General Chemistry I **AND**
- CHEM 1112 General Chemistry I Recitation/Lab
- CHEM 1223 General Chemistry II **AND**
- CHEM 1232 General Chemistry II Recitation/Lab

Physics 8

Required courses:

- PHY 2014 Physics for Scientists and Engineers I and Lab
- PHY 2114 Physics for Scientists and Engineers II and Lab

Earth Science 4

Required course:

- PHY 3014 Earth Science

History and Nature of Science 3

Required course:

- BIO 4103 History and Nature of Science

**Minimum
Required Hours**

Science Education - Physics 26-27

Math Courses 14-15

- MATH 2305 Accelerated Calculus 1 and 2 **OR**
- MATH 2313 Calculus 1 **AND**
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 3103 Differential Equations

Physics and Engineering Courses 12

- ENGR 2033 Statics
- ENGR 2043 Dynamics
- ENGR 3302 Engineering Statistics and Experimentation
- PHY 4801 Physics Capstone
- PHY 3103 Modern Physics

Professional Education 31

- PTE 3023 Foundations of American Education/Field Exp
- PTE 3153 Adolescent Psychology
- SPED 4123 Teaching Individuals with Disabilities
- IME 3312 Technology for Teachers
- ^BIO 4853 General Methods of Teaching Science and Lab
- ^PTE 4172 Educational Assessment
- ^PTE 4533 Educational Psych/Field Experience
- ^#PTE 4811 Contemporary Issues
- ^#PTE 4838 Student Teaching Secondary
- ^#PTE 4853 Classroom Management & Instruction

^ Admission to Teacher Education required

#To be taken the same semester

The number of credits needed to meet degree requirements exceeds 124 hours and will vary according to course selection.

Program: **Science Education**
Major: **Science Education - Physics**
Degree: Bachelor of Science in Education (B.S.Ed.)

Dept: Engineering and Physics
College: Mathematics and Science
Major Code: 6044

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Minimum Graduation Requirements

1. Overall GPA in all college course work 2.75
2. In courses in English Composition, Professional Education,
and area of specialization (major) "C"
3. Proficiency in foreign language Novice 4 level

**For other regulations pertaining to graduation, see
pages 63-64 of the 2012-2013 catalog.**