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 Statistics
Major Code: 6140

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

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
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 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 2343 Calculus 4
MATH 2753 Technology for Professional Math and Statistics
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 1
# MATH 4233 Mathematics of Life Contingencies 2

Statistics Core ............................................................... 15
Required courses:
STAT 2113 Statistical Methods
STAT 4103 Applied Experimental Design OR
STAT 4313 Nonparametric Statistics
# STAT 4113 Mathematical Statistics 1
# STAT 4123 Mathematical Statistics 2
* STAT 4213 Applied Regression Analysis

Finance and Insurance Electives ............................................... 15
Select from the following:
* ECON 2103 Principles of Microeconomics
* ECON 2203 Principles of Macroeconomics

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 69-70 of the 2016-2017 catalog.
**Program:** Biology  
**Major:** Biology  
**Degree:** Bachelor of Science (B.S.)

<table>
<thead>
<tr>
<th>University Core</th>
<th>(Total Listed 42-44)</th>
</tr>
</thead>
</table>
| **Specific courses within the University Core are listed on pages 98-99.**  
* 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 |
| **Minimum Required Hours** | **University Core** |
| **Support Courses** | 0-6 |
| **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 Core | 67 |
| Biology Core (required of all degree candidates) | 26 |
| **Required Courses:**  
BIO 1204 Biology I for Majors  
BIO 1225 Biology II for Majors and Lab  
BIO 2203 Cell Biology  
BIO 2211 Cell Biology Laboratory  
BIO 3054 Microbiology for Majors and Lab  
BIO 3303 Genetics  
BIO 3543 General Ecology  
BIO 3703 Evolution  
*BIO 4840 Capstone |
| **Minimum Required Hours** | **Biology Core** |
| **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 **OR**  
CHEM 3013 Organic Chemistry for Life Sciences  
CHEM 3312 Organic Chemistry I Lab **OR**  
CHEM 3022 Organic Chemistry for Life Sciences Lab |
| **Physics** | 4 |
| Required course:  
PHY 1114 General Physics I and Lab |
| **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 |

**Upper Division Biology Electives**

(to bring major total to 67)**

**Any 3000/4000 level UCO BIO course or its equivalent AND/OR**

CHEM 3403 Biochemistry I

**At least five courses taken for the B.S. in Biology must be BIO courses with a lab. These courses include the three lab courses required as part of the core: BIO 1225, BIO 2211, and BIO 3054.**

*To enroll in a Capstone Experience, students must complete a minimum of 60 credit hours. This 0 credit hour course is designed to be taken in conjunction with a capstone experience. Capstone experiences may include the following courses or special projects in biology. Special projects include but are not limited to independent research, service learning, professional school applications, or other equivalent experiences as approved by the Capstone Coordinator. Approval of the Capstone Coordinator is required before starting any capstone experience. A reflective writing piece, which must receive a passing score, will be required for all capstones.

**BIO 3000 Workshop in Biology**
**BIO 3990 Advanced Topics in Biology**
**BIO 4012 Intro to Biological Research**
**BIO 4871 Senior Seminar**
**BIO 4900 Practicum in Biology**
**BIO 4920 Workshop in Biology**
**BIO 4930 Individual Study in Biology**
**BIO 4950 Internship in Biology**
**BIO 4960 Institute in Biology**
**BIO 4970 Study Tour in Biology**
**BIO 4900 Practicum in Biology**

A maximum of 2 credit hours of the courses listed above, whether taken in conjunction with the capstone experience or not, will apply to the 67 credit hours required in the major except when BIO 4012 is chosen. If BIO 4012 is chosen as the capstone experience, an additional 2 credit hours may be taken.

- CONTINUED ON NEXT PAGE -
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

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 69-70 of the 2016-2017 catalog.
Program: Biology
Major: Biology-Biomedical Sciences
Degree: Bachelor of Science (B.S.)

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.
- 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

Support Courses

Support Courses .................................................................0-6
Students majoring in Biology-Biomedical Sciences 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-Biomedical Sciences ............................................ 73

Biology Core ................................................................... 20
Required Courses:
BIO 1204 Biology I for Majors
BIO 1225 Biology II for Majors and Lab
BIO 2203 Cell Biology
BIO 2211 Cell Biology Laboratory
BIO 3054 Microbiology for Majors and Lab
BIO 3303 Genetics
*BIO 4840 Capstone

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 OR
CHEM 3013 Organic Chemistry for Life Sciences
CHEM 3312 Organic Chemistry I Lab OR
CHEM 3022 Organic Chemistry for Life Sciences Lab

Physics ............................................................................ 4
Required course:
PHY 1114 General Physics I and Lab

**Guided Electives .............................................................. 28
Selected from the following:

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

BIO 3254 Comparative Vertebrate Anatomy and Lab
BIO 3311 Intro to Genetics Lab Methods
BIO 3414 Histology and Lab
BIO 3703 Evolution
BIO 3803 Mammalian Physiology I
BIO 3813 Mammalian Physiology II
BIO 4134 Developmental Biology and Lab
BIO 4414 Virology and Lab
BIO 4515 Pathogenic Micro and Immunology & Lab
BIO 4622 Methods of Human Dissection & Prosection
BIO 4763 Biology of Cancer
BIO 4774 Parasitology and Lab
CHEM 3323 Organic Chemistry II
CHEM 3332 Organic Chemistry II Lab
CHEM 3403 Biochemistry I
CHEM 4103 Biochemistry II
PHY 1214 General Physics II and Lab

*A maximum of 2 credit hours from the following list of capstone courses may apply toward the 28 credit hours of guided electives.

BIO 3000 Workshop in Biology
BIO 3990 Advanced Topics in Biology
BIO 4012 Intro to Biological Research
BIO 4871 Senior Seminar
BIO 4900 Practicum in Biology
BIO 4920 Workshop in Biology
BIO 4930 Individual Study in Biology
BIO 4950 Internship in Biology
BIO 4960 Institute in Biology
BIO 4970 Study Tour in Biology

*To enroll in a Capstone Experience, students must complete a minimum of 60 credit hours. This 0 credit hour course is designed to be taken in conjunction with a capstone experience. Capstone experiences may include the above courses, or special projects in biology. Special projects include but are not limited to independent research, service learning.

- CONTINUED ON NEXT PAGE -
Program: Biology - continued
Major: Biology-Biomedical Sciences
Degree: Bachelor of Science (B.S.)

Minimum Required Hours

- CONTINUED FROM PREVIOUS PAGE -

professional school applications, or other equivalent experiences as approved by the Capstone Coordinator. Approval of the Capstone Coordinator is required before starting any capstone experience. A reflective writing piece, which must receive a passing score, will be required for all capstones.

Electives to bring total to................................. 124

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

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 69-70 of the 2016-2017 catalog.

**Students accepted to graduate medical and allied health professional schools (e.g. Chiropractic, Dentistry, Medicine, Optometry, Osteopathic Medicine, Pharmacy, Physician Assistant, Veterinary Medicine) prior to completing this degree will be allowed to transfer a maximum of 30 credit hours from the first year of medical course work toward the guided electives and electives included in this degree.

To be eligible, students must have successfully completed the following minimum requirements from UCO before matriculation into the professional program: 1) 94 credit hours total; 2) 30 credit hours in residence at UCO; 3) 15 upper division credit hours in the major; 4) 50% of the total major credit hours; and 5) all regular degree requirements, including general education. (Students must apply for their bachelor’s degree within two years of completing their UCO work, but no later than graduation from medical school.)
Program: Biology
Major: Biology-Medical Laboratory Science
Degree: Bachelor of Science (B.S.)

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.
- 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

Minimum Required Hours

Support Courses

Support Courses ................................................................. 0-3
Students majoring in Biology-Medical Laboratory Science are encouraged to complete the following courses in high school.

Two years of high school algebra OR
MATH 1513 College Algebra

Major Requirements

Biology-Medical Laboratory Sciences ................................. 87
Students may earn the B.S. in Biology-Medical Laboratory Science from UCO 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 ..................................................... 47
Required Courses:
BIO 1204 Biology I for Majors
BIO 1225 Biology II for Majors and Lab
BIO 2203 Cell Biology
BIO 2211 Cell Biology Laboratory
BIO 2604 Human Physiology and Lab
BIO 3054 Microbiology for Majors and Lab
BIO 3303 Genetics
BIO 4515 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 .................................. 4
Selected from the following courses:
BIO 3403 Comparative Animal Physiology OR
BIO 3464 Comparative Animal Physiology and Lab
BIO 3414 Histology and Lab

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

BIO 3803 Mammalian Physiology I
BIO 3813 Mammalian Physiology II
BIO 4414 Virology and Lab
BIO 4774 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 an approved affiliate Hospital Medical Laboratory Science Program and satisfactorily complete the following courses through UCO.

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 Medical Laboratory Science 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 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 69-70 of the 2016-2017 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 98-99.

- 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

<table>
<thead>
<tr>
<th>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support Courses ........</td>
</tr>
<tr>
<td>Biomedical Engineering</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Historical and Political Analysis ................... 6</td>
</tr>
<tr>
<td>American National Government .................................. 3</td>
</tr>
<tr>
<td>American History .................................................. 3</td>
</tr>
</tbody>
</table>

- 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

<table>
<thead>
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<th>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support Courses ........</td>
</tr>
<tr>
<td>Biomedical Engineering</td>
</tr>
</tbody>
</table>

**Support Courses**

- 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
- One year High School Physics OR
- PHY 1003 Introduction to Physics

**Major Requirements**

**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
  - BME 1311 Introduction to Biomedical Engineering
  - ENGR 2033 Statics
  - ENGR 2303 Electrical Science
  - ENGR 2311 Electrical Science Laboratory
  - #BME 3043 Biomaterials
  - BME 3113 Principles of Biomedical Engineering
  - ENGR 3223 Digital Logic Design and Laboratory
  - ENGR 3303 Engineering Probability and Statistics
  - #ENGR 3323 Signals and Systems

- 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

- Mathematics .......................................................... 15

- Required courses:
  - MATH 2313 Calculus 1
  - 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 ........................................... 3-6**

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

Students in Concentration A are required to have 3 credit hours from Biomedical Engineering electives. Students in Concentration B are required to have 6 credit hours from Biomedical Engineering electives.

Complete all the courses from one of the following concentrations:

<table>
<thead>
<tr>
<th>Concentration A: (courses in preparation for Pre-Med fields)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1223 General Chemistry II</td>
</tr>
<tr>
<td>CHEM 1232 General Chemistry II Recitation/Laboratory</td>
</tr>
<tr>
<td>CHEM 3303 Organic Chemistry I</td>
</tr>
</tbody>
</table>

- CONTINUED ON NEXT PAGE -
Concentration B: (courses in preparation for Instrumentation fields)

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:
- BME 4243 Modeling and Analysis of Biomedical Systems
- ENGR 3443 Fluid Mechanics
- CHEM 3403 Biochemistry I
- CHEM 3323 Organic Chemistry II
- ENGR 3183 Electromagnetic Fields I

# Admission into Engineering and Physics Upper Division is required.

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 69-70 of the 2016-2017 catalog.

Admission into Engineering and Physics Upper Division

Students seeking the B.S. in Biomedical Engineering, Engineering Physics – Electrical Engineering, Engineering Physics – Mechanical Engineering, and Engineering Physics – Physics are required to make formal application to the Chairperson of the Department of Engineering and Physics for admission into the upper division of each of these majors. Applications must be submitted to the Department of Engineering and Physics on or before the last Monday of January for Fall admission and the last Monday of August for Spring admission.

Upper division admission is open to students meeting Engineering and Physics upper division admission requirements. To be admitted into upper division, the student must have:

- A minimum retention grade point average (GPA) of 2.00 in all course work completed by the time the student is formally admitted into upper division.
- Completed 60 semester credit hours by the time the student is formally admitted into upper division.
- Completed the following courses or their equivalent with a minimum grade of “C” by the time the student is formally admitted into upper division:
  - MATH 2313 Calculus 1
  - MATH 2323 Calculus 2
  - MATH 2333 Calculus 3
  - MATH 2343 Calculus 4
  - MATH 3103 Differential Equations (Recommended)
  - PHY 2014 Physics for Science & Engineering I & Lab
  - PHY 2114 Physics for Science & Engineering II & Lab

Formal approval by the department Faculty Advisor and Department Chair is required for admission. Preference is given to University of Central Oklahoma students. The student may enroll in no more than nine (9) hours of 3000 and 4000 level courses in the major prior to admission into upper division unless they secure formal approval from the Department of Engineering and Physics.
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 98-99.
* Courses from the major may apply to the areas marked in the University Core.

<table>
<thead>
<tr>
<th>Written and Oral Communication</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative Reasoning/Scientific Method</td>
<td>10-11</td>
</tr>
<tr>
<td>Math</td>
<td>3</td>
</tr>
<tr>
<td>Life Science</td>
<td>4</td>
</tr>
<tr>
<td>Physical Science</td>
<td>3-4</td>
</tr>
<tr>
<td>Critical Inquiry and Aesthetic Analysis</td>
<td>6</td>
</tr>
<tr>
<td>Aesthetic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Critical Inquiry</td>
<td>3</td>
</tr>
<tr>
<td>American Historical and Political Analysis</td>
<td>6</td>
</tr>
<tr>
<td>American National Government</td>
<td>3</td>
</tr>
<tr>
<td>American History</td>
<td>3</td>
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<td>Cultural and Language Analysis</td>
<td>3-4</td>
</tr>
<tr>
<td>Second Language</td>
<td>4</td>
</tr>
<tr>
<td>Cultural Analysis</td>
<td>3</td>
</tr>
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<td>Social and Behavioral Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Life Skills</td>
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<tr>
<td>Required Health Course</td>
<td>2</td>
</tr>
<tr>
<td>Elective Life Skills</td>
<td>3</td>
</tr>
</tbody>
</table>

Support Courses

Support Courses | 0-6
--- | ---
Required Courses:
MATH 1513 College Algebra AND MATH 1593 Plane Trigonometry OR High School Equivalent

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:
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)

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.

The following are highly recommended:
CHEM 3403 Biochemistry I
ENG 4023 Technical Writing
MATH 2343 Calculus 4
PHY 3103 Modern Physics

For other regulations pertaining to graduation, see pages 69-70 of the 2016-2017 catalog.
Program: Chemistry  
Major: Chemistry - ACS Certificate  
Degree: Bachelor of Science (B.S.)

Department: Chemistry  
College: Mathematics and Science  
Major Code: 6061

### University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.

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

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<thead>
<tr>
<th>Written and Oral Communication</th>
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<tbody>
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<td>Quantitative Reasoning/Scientific Method</td>
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<td>- Life Science</td>
<td>4</td>
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<tr>
<td>- Physical Science</td>
<td>3-4</td>
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<td>Critical Inquiry and Aesthetic Analysis</td>
<td>6</td>
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<td>3</td>
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<tr>
<td>American History</td>
<td>3</td>
</tr>
<tr>
<td>Cultural and Language Analysis</td>
<td>3-4</td>
</tr>
<tr>
<td>- Second Language</td>
<td>4</td>
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<tr>
<td>- Cultural Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Social and Behavioral Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Life Skills</td>
<td>5</td>
</tr>
<tr>
<td>- Required Health Course</td>
<td>2</td>
</tr>
<tr>
<td>- Elective Life Skills</td>
<td>3</td>
</tr>
</tbody>
</table>

### Support Courses

Support Courses .................................................. 0-6

Required Courses:
- MATH 1513 College Algebra AND
- MATH 1593 Plane Trigonometry OR High School Equivalent

### 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:
- 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 (3000/4000 level) ....................... 5

Electives to bring total to .................................. 124

The following are highly recommended:
- 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 69-70 of the 2016-2017 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 98-99.
• 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

Support Courses ...................................................................... 0-6

Support Courses
Required Courses:
MATH 1513 College Algebra AND
MATH 1593 Plane Trigonometry OR
High School Equivalent

Major Requirements

Chemistry - Health Sciences ..................................................... 76

Common Core ......................................................................... 56
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 2621 Professionalism in Chemistry I
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
CHEM 3621 Professionalism in Chemistry II
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 ............................................................. 20
Required courses: ................................................................. 14
BIO 3054 Microbiology for Majors and Lab
CHEM 3203 Introductory Physical Chemistry
CHEM 3403 Biochemistry I
CHEM 3442 Experimental Biochemistry
CHEM 4892 Capstone for Chemistry

Electives to bring total to ..................................................... 124

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 69-70 of the 2016-2017 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 98-99.
• 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

Minimum Required Hours

Support Courses .................................................................0-9

Students majoring in Computer Science 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

*A grade of ‘C’ or better is required for both MATH 1513 and 1593 to take MATH 2313.

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 ...............................................................80-82

Required ................................................................. 56
^ CMSC 1613 Programming I
^ CMSC 1621 Programming I Laboratory
^ CMSC 2123 Discrete Structures
^ CMSC 2613 Programming II
^ CMSC 2833 Computer Organization I
  SE 3103 Object Oriented Software Design and Construction
^ 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
  ^SE 4283 Software Engineering I
  ^CMSC 4401 Ethics in Computing
^CMSC 4513 Software Design and Development
^ MATH 2313 Calculus I
^ MATH 2323 Calculus 2

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

Elective Science/Math Courses ............................................... 8-10
Select a minimum of eight (8) hours including at least one of the CHEM or PHY lab courses.

CHEM 1103 General Chemistry I
CHEM 1112 General Chemistry I Recitation/Laboratory
CHEM 1223 General Chemistry II
CHEM 1232 General Chemistry II Recitation/Laboratory
PHY 1114 General Physics I and Laboratory
PHY 1214 General Physics II and Laboratory
PHY 2014 Physics for Scientists & Engineers I and Lab
PHY 2114 Physics for Scientists & Engineers II and Lab

Any 2/3/4000 level MATH or STAT course with the following exceptions: MATH 2053, 2113, 2123, 2133, 2153, 2743, 3323, or 4843.

Elective CMSC or SE courses ...................................................... 16

Selected from the following:
CMSC 2621 Programming II Laboratory
CMSC 3621 Data Structures/Algorithms Laboratory

Any 3/4000 level CMSC or SE courses
In addition to CMSC 2621 and 3621, an additional 6 hours of CMSC or SE electives may be taken at the 2000 level.

- CONTINUED ON NEXT PAGE -
Minimum Required Hours

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

- CONTINUED FROM PREVIOUS PAGE -

SE 4513 may not be used to satisfy the CMSC or SE elective requirement.

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

Credit cannot be received for both CMSC 3303 and SE 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 69-70 of the 2016-2017 catalog.
Program: Computer Science
Major: Computer Science - Applied
Degree: Bachelor of Science (B.S.)

Department: 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 98-99.
* 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

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

*A grade of 'C' or better is required for both MATH 1513 and 1593 to take MATH 2313.

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 .................................................. 58

Required ......................................................... 46

^ CMSC 1613 Programming I
^ CMSC 1621 Programming I Laboratory
^ CMSC 2413 Visual Programming
^ CMSC 2123 Discrete Structures
^ CMSC 2613 Programming II
^ CMSC 2833 Computer Organization I
^ SE 3103 Object Oriented Software Design and Construction
^ CMSC 3303 System Analysis and Design OR
^ SE 4283 Software Engineering I
^ 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 I
^ MATH 2323 Calculus 2

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

Elective CMSC or SE courses ................................................. 12
Any 3/4000 level CMSC or SE courses except SE 4513
Any programming labs (CMSC 2621 and 3621)

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

Credit cannot be received for both CMSC 3303 and SE 4283.

Applied Area of Study .......................................................... 18

Minor
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.

OR

Associate degree or comparable concentration in an information technology-related discipline transferred from a regionally accredited two- or four-year college or international equivalent with the approval of the Computer Science Department.
Minimum Required Hours

If less than 18 hours are transferred under this category, the student should take 2/3/4000 level CMSC electives to make up the difference. A student may take additional CMSC 3/4000 electives to bring the total hours of upper-division courses to 40.

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 69-70 of the 2016-2017 catalog.
### University Core (Total Listed 42-44)

<table>
<thead>
<tr>
<th>Specific courses within the University Core are listed on pages 98-99.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>* Courses from the major may apply to the areas marked in the University Core.</td>
<td></td>
</tr>
</tbody>
</table>

#### 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  |

#### 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**

<table>
<thead>
<tr>
<th>CMSC 1513 Beginning Programming</th>
</tr>
</thead>
</table>

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

| *MATH 1513 College Algebra AND  |
| *MATH 1593 Plane Trigonometry  |

* A grade of ‘C’ or better is required for both MATH 1513 and 1593 to take MATH 2313.

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 ................................. 79

**Required Courses ................................................................. 64**

<table>
<thead>
<tr>
<th>CMSC 1613 Programming I</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMSC 1621 Programming I Laboratory</td>
</tr>
<tr>
<td>CMSC 2123 Discrete Structures</td>
</tr>
<tr>
<td>CMSC 2413 Visual Programming</td>
</tr>
<tr>
<td>CMSC 2613 Programming II</td>
</tr>
<tr>
<td>CMSC 2833 Computer Organization I</td>
</tr>
<tr>
<td>SE 3103 Object Oriented Software Design and Construction</td>
</tr>
<tr>
<td>CMSC 3303 Systems Analysis and Design</td>
</tr>
<tr>
<td>CMSC 3413 Enterprise Programming</td>
</tr>
<tr>
<td>CMSC 3613 Data Structures and Algorithms</td>
</tr>
<tr>
<td>CMSC 4003 Applications Database Management</td>
</tr>
<tr>
<td>CMSC 4063 Networks</td>
</tr>
<tr>
<td>CMSC 4153 Operating Systems</td>
</tr>
</tbody>
</table>

#### American Historical and Political Analysis ................................. 6

| American National Government ............................................. 3  |
| American History .................................................................... 3  |

#### Cultural and Language Analysis .................................................. 3-4

| Second Language ..................................................................... 4  |
| Cultural Analysis .................................................................... 3  |

#### Social and Behavioral Analysis .................................................... 3

#### Life Skills .................................................................................. 5

| Required Health Course ......................................................... 2  |

| Elective Life Skills ............................................................... 3  |

<table>
<thead>
<tr>
<th>Minimum Required Hours</th>
<th>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>^ CMSC 4323 Computer and Network Security</td>
<td></td>
</tr>
<tr>
<td>^ CMSC 4513 Software Design and Development</td>
<td></td>
</tr>
<tr>
<td>^ MATH 2313 Calculus I</td>
<td></td>
</tr>
<tr>
<td>^ MATH 2323 Calculus II</td>
<td></td>
</tr>
<tr>
<td>^ STAT 2103 Introduction to Statistics for Sciences OR</td>
<td></td>
</tr>
<tr>
<td>^ STAT 4113 Mathematical Statistics 1</td>
<td></td>
</tr>
<tr>
<td>ACCT 2113 Accounting I</td>
<td></td>
</tr>
<tr>
<td>ACCT 2133 Accounting II</td>
<td></td>
</tr>
<tr>
<td>MGMT 3103 Principles of Management</td>
<td></td>
</tr>
<tr>
<td>ISOM 3263 Management Information Systems</td>
<td></td>
</tr>
</tbody>
</table>

^ A grade of ‘C’ or better must be earned in all required CMSC, SE, MATH, and STAT courses.

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

#### Elective CMSC or SE courses ....................................................... 9

| Any 3/4000 level CMSC or SE courses except SE 4513  |
| Any programming labs (CMSC 2621 and 3621)  |

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

Credit cannot be received for both CMSC 3303 and SE 4283.

#### Other areas of application ......................................................... 6

Selected from the following:

| ACCT 3113 Managerial Accounting  |
| FIN 3563 Fundamentals of Business Finance  |
| ISOM 3323 Business Analytics  |
| ISOM 4063 Computer Simulation  |
| ISOM 4283 Developing Decision Support Systems  |
| ISOM 4363 Information Systems Management  |
| ISOM 4513 Virtualization  |

- CONTINUED ON NEXT PAGE -
Program: Computer Science - continued
Major: Computer Science - Information Science
Degree: Bachelor of Science (B.S.)

Minimum Required Hours

- CONTINUED FROM PREVIOUS PAGE -

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

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.
- 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

Support Courses

Support Courses ................................................................. 9-18
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
One year of high school physics OR
PHY 1003 Introduction to Physics

Major Requirements

Engineering Physics - Electrical Engineering ................................... 92

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 ................................................................. 55
Required courses:
ENGR 1112 Introduction to Engineering and Laboratory
ENGR 1213 Engineering Computing and Laboratory
ENGR 2033 Statics
ENGR 2303 Electrical Science
ENGR 2311 Electrical Science Laboratory
ENGR 3031 Digital Logic Design and Laboratory
ENGR 3303 Engineering Probability & Statistics
ENGR 3313 Signals and Systems
ENGR 3331 Signals and Systems Laboratory
ENGR 3403 Analog Electronics
ENGR 3421 Analog Electronics Laboratory

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

Min: 18
Max: 22

- CONTINUED ON NEXT 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 69-70 of the 2016-2017 catalog.

Admission into Engineering and Physics Upper Division
Students seeking the B.S. in Biomedical Engineering, Engineering Physics – Electrical Engineering, Engineering Physics – Mechanical Engineering, and Engineering Physics – Physics are required to make formal application to the Chairperson of the Department of Engineering and Physics for admission into the upper division of each of these majors. Applications must be submitted to the Department of Engineering and Physics on or before the last Monday of January for Fall admission and the last Monday of August for Spring admission.

Upper division admission is open to students meeting Engineering and Physics upper division admission requirements. To be admitted into upper division, the student must have:
• A minimum retention grade point average (GPA) of 2.00 in all course work completed by the time the student is formally admitted into upper division.
• Completed 60 semester credit hours by the time the student is formally admitted into upper division.
• Completed the following courses or their equivalent with a minimum grade of “C” by the time the student is formally admitted into upper division:
  - MATH 2313 Calculus 1
  - MATH 2323 Calculus 2
  - MATH 2333 Calculus 3
  - MATH 2343 Calculus 4
  - MATH 3103 Differential Equations (Recommended)
  - PHY 2014 Physics for Science & Engineering I & Lab
  - PHY 2114 Physics for Science & Engineering II & Lab
  - ENGR 1112 Introduction to Engineering & Lab
  - ENGR 1213 Engineering Computing & Lab
  - ENGR 2033 Statics
  - ENGR 2303 Electrical Science
  - ENGR 2311 Electrical Science Lab
  - ENGR 3303 Engineering Probability and Statistics (Recommended)
  - CHEM 1112 General Chemistry I Recitation/Lab AND (for Biomedical Engineering)
Program: Engineering Physics  
Major: Engineering Physics - Mechanical Engineering  
Degree: Bachelor of Science (B.S.)  

Debt: Engineering and Physics  
College: Mathematics and Science  
Major Code: 6247

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.  
- 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

Support Courses  
Support Courses ................................................................. 9-18

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  
One year of high school physics OR  
PHY 1003 Introduction to Physics

Major Requirements

Engineering Physics - Mechanical Engineering ......................................... 94

Physics ................................................................. 11

Required courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 2014</td>
<td>Physics for Scientists and Engineers I and Lab</td>
</tr>
<tr>
<td>PHY 2114</td>
<td>Physics for Scientists and Engineers II and Lab</td>
</tr>
<tr>
<td>PHY 3883</td>
<td>Mathematical Physics I</td>
</tr>
</tbody>
</table>

Engineering ................................................................. 57

Required courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 1112</td>
<td>Introduction to Engineering and Laboratory</td>
</tr>
<tr>
<td>ENGR 1213</td>
<td>Engineering Computing and Laboratory</td>
</tr>
<tr>
<td>ENGR 2033</td>
<td>Statics</td>
</tr>
<tr>
<td>ENGR 2043</td>
<td>Dynamics</td>
</tr>
<tr>
<td>ENGR 2143</td>
<td>Strength of Materials</td>
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<tr>
<td>ENGR 2151</td>
<td>Strength of Materials Lab</td>
</tr>
<tr>
<td>ENGR 2303</td>
<td>Electrical Science</td>
</tr>
<tr>
<td>ENGR 2311</td>
<td>Electrical Science Laboratory</td>
</tr>
<tr>
<td>ENGR 3203</td>
<td>Thermodynamics</td>
</tr>
<tr>
<td>ENGR 3211</td>
<td>Thermal Engineering Laboratory</td>
</tr>
<tr>
<td>ENGR 3303</td>
<td>Engineering Probability and Statistics</td>
</tr>
<tr>
<td>#ENGR 3323</td>
<td>Signals and Systems</td>
</tr>
<tr>
<td>ENGR 3331</td>
<td>Signals and Systems Laboratory</td>
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</tbody>
</table>

#ENGR 3363 Mechanical Engineering Design  
#ENGR 3413 Materials Science  
#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 ................................................................. 15

Required courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 2313</td>
<td>Calculus 1</td>
</tr>
<tr>
<td>MATH 2323</td>
<td>Calculus 2</td>
</tr>
<tr>
<td>MATH 2333</td>
<td>Calculus 3</td>
</tr>
<tr>
<td>MATH 2343</td>
<td>Calculus 4</td>
</tr>
<tr>
<td>MATH 3103</td>
<td>Differential Equations</td>
</tr>
</tbody>
</table>

Chemistry ................................................................. 5

Required courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1315</td>
<td>Chemistry for Engineering and Lab</td>
</tr>
</tbody>
</table>

Physics or Engineering Electives ................................................ 6

Selected from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 3153</td>
<td>Machine Dynamics</td>
</tr>
<tr>
<td>ENGR 3223</td>
<td>Digital Logic Design and Laboratory</td>
</tr>
<tr>
<td>ENGR 4103</td>
<td>Finite Element Analysis</td>
</tr>
<tr>
<td>ENGR 4153</td>
<td>Vibration</td>
</tr>
<tr>
<td>ENGR 4203</td>
<td>Refrigeration and Air Conditioning</td>
</tr>
<tr>
<td>ENGR 4303</td>
<td>Control Systems</td>
</tr>
<tr>
<td>ENGR 4313</td>
<td>Fluid Dynamics</td>
</tr>
<tr>
<td>BME 4343</td>
<td>Biomechanics</td>
</tr>
<tr>
<td>PHY 4163</td>
<td>Analytical Mechanics</td>
</tr>
</tbody>
</table>

#Students in the Accelerated BS/MS program in Engineering Physics must enroll in the graduate level versions of this course.

#Admission into Engineering and Physics Upper Division is required.

- CONTINUED ON NEXT 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 69-70 of the 2016-2017 catalog.

Admission into Engineering and Physics Upper Division

Students seeking the B.S. in Biomedical Engineering, Engineering Physics – Electrical Engineering, Engineering Physics – Mechanical Engineering, and Engineering Physics – Physics are required to make formal application to the Chairperson of the Department of Engineering and Physics for admission into the upper division of each of these majors. Applications must be submitted to the Department of Engineering and Physics on or before the last Monday of January for Fall admission and the last Monday of August for Spring admission.

Upper division admission is open to students meeting Engineering and Physics upper division admission requirements. To be admitted into upper division, the student must have:

- A minimum retention grade point average (GPA) of 2.00 in all course work completed by the time the student is formally admitted into upper division.
- Completed 60 semester credit hours by the time the student is formally admitted into upper division.
- Completed the following courses or their equivalent with a minimum grade of “C” by the time the student is formally admitted into upper division:
  - MATH 2313 Calculus 1
  - MATH 2323 Calculus 2
  - MATH 2333 Calculus 3
  - MATH 2343 Calculus 4
  - MATH 3103 Differential Equations (Recommended)
  - PHY 2014 Physics for Science & Engineering I & Lab
  - PHY 2114 Physics for Science & Engineering II & Lab
  - ENGR 1112 Introduction to Engineering & Lab
  - ENGR 1213 Engineering Computing & Lab
  - ENGR 2033 Statics
  - ENGR 2303 Electrical Science
  - ENGR 2311 Electrical Science Lab
  - ENGR 3303 Engineering Probability and Statistics (Recommended)
  - CHEM 1112 General Chemistry I Recitation/Lab AND (for Biomedical Engineering)
  - CHEM 1103 General Chemistry I OR (for Biomedical Engineering)
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 98-99.

* 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

Minimum Required Hours

Support Courses .......................................................... 9-18

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
One year of high school physics OR
PHY 1003 Introduction to Physics

Major Requirements

Engineering Physics - Physics .............................................. 91-96

Physics .......................................................... 23

Required courses .......................................................... 17

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 4203 Quantum Mechanics

*Physics or Engineering Elective ........................................... 3
  4000-level PHY, ENGR, or BME course

*Physics Elective .................................................. 3
  4000-level PHY course

Engineering .......................................................... 48

Required courses .......................................................... 45

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

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

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

Mathematics ........................................................................... 15

Required courses:

MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 2343 Calculus 4
MATH 3103 Differential Equations

Chemistry .......................................................................... 5-10

Required courses:

CHEM 1315 Chemistry for Engineering and Lab
CHEM 1103 General Chemistry I AND
CHEM 1112 General Chemistry I Recitation/Laboratory AND
CHEM 1223 General Chemistry II AND
CHEM 1232 General Chemistry II Recitation/Laboratory

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

# Admission into Engineering and Physics Upper Division is required.

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

- CONTINUED ON NEXT PAGE -
Program: Engineering Physics - continued
Major: Engineering Physics - Physics
Degree: Bachelor of Science (B.S.)

- 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 69-70 of the 2016-2017 catalog.

Admission into Engineering and Physics Upper Division
Students seeking the B.S. in Biomedical Engineering, Engineering Physics – Electrical Engineering, Engineering Physics – Mechanical Engineering, and Engineering Physics – Physics are required to make formal application to the Chairperson of the Department of Engineering and Physics for admission into the upper division of each of these majors. Applications must be submitted to the Department of Engineering and Physics on or before the last Monday of January for Fall admission and the last Monday of August for Spring admission.

Upper division admission is open to students meeting Engineering and Physics upper division admission requirements. To be admitted into upper division, the student must have:

• A minimum retention grade point average (GPA) of 2.00 in all course work completed by the time the student is formally admitted into upper division.
• Completed 60 semester credit hours by the time the student is formally admitted into upper division.
• Completed the following courses or their equivalent with a minimum grade of “C” by the time the student is formally admitted into upper division:

  MATH 2313 Calculus 1
  MATH 2323 Calculus 2
  MATH 2333 Calculus 3
  MATH 2343 Calculus 4
  MATH 3103 Differential Equations (Recommended)
  PHY 2014 Physics for Science & Engineering I & Lab
  PHY 2114 Physics for Science & Engineering II & Lab
  ENGR 1112 Introduction to Engineering & Lab
  ENGR 1213 Engineering Computing & Lab
  ENGR 2033 Statics
  ENGR 2303 Electrical Science
  ENGR 2311 Electrical Science Lab
  ENGR 3303 Engineering Probability and Statistics (Recommended)
  CHEM 1112 General Chemistry I Recitation/Lab AND (for Biomedical Engineering)
  CHEM 1103 General Chemistry I OR (for Biomedical Engineering)
  CHEM 1315 Chemistry for Engineering and Lab (for Engineering Physics-Electrical Systems, Mechanical Systems, and Physics)

Formal approval by the department Faculty Advisor and Department Chair is required for admission. Preference is given to University of Central Oklahoma students. The student may enroll in no more than nine (9) hours of 3000 and 4000 level courses in the major prior to admission into upper division unless they secure formal approval from the Department of Engineering and Physics.
Program: Funeral Service  
Major: Funeral Service  
Degree: Bachelor of Science (B.S.)

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.  
* Courses from the major may apply to the areas marked in the University Core.

<table>
<thead>
<tr>
<th>Area</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written and Oral Communication</td>
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</tr>
<tr>
<td>Quantitative Reasoning/Scientific Method</td>
<td>Math</td>
</tr>
<tr>
<td></td>
<td>Life Science</td>
</tr>
<tr>
<td></td>
<td>Physical Science</td>
</tr>
<tr>
<td>Critical Inquiry and Aesthetic Analysis</td>
<td>Aesthetic Analysis</td>
</tr>
<tr>
<td></td>
<td>Critical Inquiry</td>
</tr>
</tbody>
</table>

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 69-70 of the 2016-2017 catalog.

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


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 profession 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.

All funeral service students must apply for admission to the funeral service program. Each applicant must provide an official transcript of high school or college work that is directly mailed from the institution where the credits were received. Said transcripts must be sent to: Department of Funeral Service, University of Central Oklahoma, 100 N. University Drive, Edmond, OK 73034.

To apply for admission, please visit http://www.uco.edu/funeral/application.
Program: **Mathematics**  
Major: **Mathematics**  
Degree: Bachelor of Science (B.S.)

**University Core** (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.
- 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

**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**

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 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 2753 Technology for Professional Math and Statistics
- 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 1

**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 2

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 core.

**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 69-70 of the 2016-2017 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 98-99.  
• 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

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 69-70 of the 2016-2017 catalog.

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

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
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 .................................48

Required courses................................................................. 27

MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 2343 Calculus 4
MATH 2753 Technology for Professional Math and Statistics
MATH 3113 Foundations of Advanced Math
MATH 3143 Linear Algebra
MATH 3183 Introduction to Modern Algebra
MATH 4143 Introduction to Analysis 1

Applied Mathematics................................................................. 21

Required courses:
STAT 2113 Statistical Methods
MATH 3103 Differential Equations
MATH 4113 Operations Research 1
STAT 4113 Mathematical Statistics 1
MATH 4263 Numerical Linear Algebra OR
MATH 4363 Applied Numerical Analysis
Any 3000 and 4000 level MATH or STAT course to bring the total to 21.

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.
University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.

- 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
- Cultural Analysis ................................................................ 3

Social and Behavioral Analysis ..................................................... 3

Life Skills ..................................................................................... 5

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

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 69-70 of the 2016-2017 catalog.

Major Requirements

Mathematics - Statistics ................................................................. 54

The following courses .................................................................... 30

Required ......................................................................................... 27

MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 2343 Calculus 4
MATH 2753 Technology for Professional Math and Statistics
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 2113 Statistical Methods
STAT 4103 Applied Experimental Design
STAT 4113 Mathematical Statistics 1
STAT 4123 Mathematical Statistics 2
STAT 4213 Applied Regression Analysis
STAT 4253 Computer Applications in Statistics
STAT 4313 Nonparametric Statistics
STAT 4513 Statistical Consulting

Electives to bring total to ....................................................... 124
Program: Mathematics Education
Major: Mathematics Education
Degree: Bachelor of Science in Education (B.S.Ed.)

Unit 1: Mathematics Electives
- Select at least two of the following:
  - MATH 2313 Calculus 1
  - MATH 2323 Calculus 2
  - MATH 2333 Calculus 3
  - MATH 2343 Calculus 4
  - MATH 2743 Technology and Mathematics Education
  - 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 2113 Statistical Methods
  - STAT 3113 Mathematical Statistics
  - STAT 4113 Mathematical Statistics 1

Unit 2: Required Health Course
- Required Health Course

Unit 3: Professional Education
- Professional Education

Unit 4: Electives to bring total to
- Electives to bring total to

Unit 5: Minimum Graduation Requirements

- Overall GPA in all college course work
- Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major)
- Proficiency in foreign language

For other regulations pertaining to graduation, see pages 69-70 of the 2016-2017 catalog.
### University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.

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

#### Written and Oral Communication
- Minimum Required Hours: 9

#### Quantitative Reasoning/Scientific Method
- Math: 3
- Life Science: 4
- Physical Science: 3-4
- Minimum Required Hours: 10-11

#### Critical Inquiry and Aesthetic Analysis
- Aesthetic Analysis: 3
- Critical Inquiry: 3
- Minimum Required Hours: 6

#### American Historical and Political Analysis
- Minimum Required Hours: 6

#### Cultural and Language Analysis
- Second Language: 4
- Minimum Required Hours: 3-4

#### Life Skills
- Minimum Required Hours: 5

### Major Requirements

#### Nursing
- Minimum Required Hours: 98

The UCO nursing program is accredited by the **Commission on Collegiate Nursing Education (http://www.aacn.nche.edu/ccne-accreditation).** Graduates of this state approved program are eligible to apply to write the National Council Licensure Examination (NCLEX-RN) for registered nurses.

#### Pre-Professional
- Minimum Required Hours: 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 2113 Statistical Methods 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
- Minimum Required Hours: 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

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.)

- 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. Score on the Test of Essential Academic Skills (TEAS).

D. Submit a criminal background check (OSBI).

E. Meet “Performance Standards for Admission and Progression in the Department of Nursing” (available in application packet).

F. 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 ACEN 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.

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.

**Accreditation Commission for Education in Nursing**
3343 Peachtree Road NE
Suite 850
Atlanta, GA 30326
Phone: 404-975-5000
Fax: 404-975-5020
Website: www.acenursing.org
### University Core (Total Listed 42-44)

<table>
<thead>
<tr>
<th>Core Area</th>
<th>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Inquiry</td>
<td>3</td>
</tr>
<tr>
<td>Aesthetic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Critical Inquiry and Aesthetic Analysis</td>
<td>6</td>
</tr>
<tr>
<td>Quantitative Reasoning/Scientific Method</td>
<td>10-11</td>
</tr>
<tr>
<td>• Math</td>
<td>3</td>
</tr>
<tr>
<td>• Life Science</td>
<td>4</td>
</tr>
<tr>
<td>• Physical Science</td>
<td>3-4</td>
</tr>
<tr>
<td>Written and Oral Communication</td>
<td>9</td>
</tr>
<tr>
<td>Support Courses</td>
<td>9-15</td>
</tr>
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<td>Mathematics</td>
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<td>BIO 1225 Biology II for Majors and Lab</td>
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<td>BIO 2203 Cell Biology</td>
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<td>BIO 3054 Microbiology for Majors and Lab</td>
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<tr>
<td>PHY 1214 General Physics II and Lab OR</td>
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<tr>
<td>PHY 2114 Physics for Scientists and Engineers II and Lab</td>
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<td>American Historical and Political Analysis</td>
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**Support Courses**

<table>
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<th>Subject</th>
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<th>Required Hours</th>
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<td>MATH</td>
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<td>Colleget Algebra OR</td>
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</tr>
<tr>
<td>MATH</td>
<td>1593</td>
<td>Plane Trigonometry</td>
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<td>ENG</td>
<td>1113</td>
<td>English Composition</td>
<td>3</td>
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<tr>
<td>ENG</td>
<td>1213</td>
<td>English Composition and Research</td>
<td>4</td>
</tr>
<tr>
<td>MCOM</td>
<td>1113</td>
<td>Fundamentals of Speech</td>
<td>3</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Degree</th>
<th>Program</th>
<th>Major</th>
<th>Degree</th>
<th>Dept.</th>
<th>College</th>
<th>Major Code</th>
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<td>Science Education - Biology</td>
<td>Biology</td>
<td>Mathematics and Science</td>
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<td>Science Education</td>
<td>Biology</td>
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</table>

**Science Education - Biology**

- 65 Required Hours

<table>
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<th>Biology</th>
<th>Course Code</th>
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<td>Biology I for Majors</td>
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<td>Cell Biology</td>
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<td>BIO</td>
<td>3054</td>
<td>Microbiology for Majors and Lab</td>
</tr>
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<td>BIO</td>
<td>3303</td>
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<td>3543</td>
<td>General Ecology</td>
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<td>BIO</td>
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<td>Evolution</td>
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</table>

**Chemistry**

- 10 Required Courses

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<td>CHEM 1112</td>
<td>General Chemistry I Recitation/Lab</td>
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</tr>
<tr>
<td>CHEM 1223</td>
<td>General Chemistry II AND</td>
<td></td>
</tr>
<tr>
<td>CHEM 1232</td>
<td>General Chemistry II Recitation/Lab</td>
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</table>

**Physics**

- 8 Required Courses

<table>
<thead>
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<th>Course Code</th>
<th>Course Name</th>
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<tr>
<td>PHY 1114</td>
<td>General Physics I and Lab OR</td>
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<tr>
<td>PHY 2014</td>
<td>Physics for Scientists and Engineers I and Lab</td>
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</tr>
<tr>
<td>PHY 1214</td>
<td>General Physics II and Lab OR</td>
<td></td>
</tr>
<tr>
<td>PHY 2114</td>
<td>Physics for Scientists and Engineers II and Lab</td>
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</table>

**Professional Education**

- 31 Required Hours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Required Hours</th>
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<tbody>
<tr>
<td>PTE 1010</td>
<td>Introduction to Teacher Education</td>
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</tr>
<tr>
<td>PTE 3023</td>
<td>Foundations of American Education/ Clinical Exp</td>
<td></td>
</tr>
<tr>
<td>PTE 3153</td>
<td>Adolescent Psychology</td>
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<tr>
<td>SPED 4123</td>
<td>Teaching Individuals with Disabilities</td>
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</tr>
<tr>
<td>BIB 4812</td>
<td>Teaching and Learning in Science Classrooms</td>
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</tr>
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<td>BIB 4853</td>
<td>General Methods of Teaching Science and Lab</td>
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<tr>
<td>PTE 4172</td>
<td>Educational Assessment</td>
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<td>PTE 4533</td>
<td>Educational Psych/Clinical Experience</td>
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<td>PTE 4811</td>
<td>Contemporary Issues</td>
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<td>PTE 4838</td>
<td>Internship/Student Teaching Secondary</td>
<td></td>
</tr>
<tr>
<td>PTE 4853</td>
<td>Classroom Management &amp; Instruction</td>
<td></td>
</tr>
</tbody>
</table>

^ 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.
Minimum Graduation Requirements

1. Overall GPA in all college course work ...................... 2.75
2. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major) ....... “C”
3. Proficiency in foreign language ............................... Novice 4 level

For other regulations pertaining to graduation, see pages 69-70 of the 2016-2017 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 98-99.

- 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

Support Courses ................................................................. 9-15

Support Courses ......................................................................
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 .......................................................... 65

Science Education - Chemistry ............................................ 37

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

Computer Science .................................................................. 3
CMSC 1513 Beginning Programming

Mathematics ............................................................................. 3
STAT 2103 Introduction to Statistics for Sciences

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

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 1010 Introduction to Teacher Education
- PTE 3023 Foundations of American Education/Clinical Exp
- PTE 3153 Adolescent Psychology
- SPED 4123 Teaching Individuals with Disabilities
- BIO 4812 Teaching and Learning in Science Classrooms
- BIO 4853 General Methods of Teaching Science & Lab
- PTE 4172 Educational Assessment
- PTE 4533 Educational Psych/Clinical Experience
- PTE 4811 Contemporary Issues
- PTE 4838 Internship/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. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major)........ “C”
3. Proficiency in foreign language ........................................... Novice 4 level

For other regulations pertaining to graduation, see pages 69-70 of the 2016-2017 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 98-99.

• 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

Minimum Required Hours

Support Courses ..........................................................9-15

Support Courses........................................................................

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..................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 1214 General Physics II and Lab OR
PHY 2014 Physics for Scientists and Engineers I and Lab

Mathematics ........................................................................... 3

Required course:
STAT 2103 Introduction to Statistics for Sciences

Earth Science .............................................................. 4

Required course:
PHY 3014 Earth Science

Minimum Required Hours

Science Education - General Science.................. 30

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

Professional Education .................................................. 31

PTE 1010 Introduction to Teacher Education
PTE 3023 Foundations of American Education/Clinical Exp
PTE 3153 Adolescent Psychology
SPED 4123 Teaching Individuals with Disabilities

^BIO 4812 Teaching and Learning in Science Classrooms
^BIO 4853 General Methods of Teaching Science and Lab
^nPTE 4172 Educational Assessment
^nPTE 4533 Educational Psych/Clinical Experience
^nPTE 4811 Contempo ary Issues
^nPTE 4838 Internship/Student Teaching Secondary
^nPTE 4853 Classroom Management & Instruction

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

- CONTINUED ON NEXT 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. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major)....... “C”
3. Proficiency in foreign language ............................... Novice 4 level

For other regulations pertaining to graduation, see pages 69-70 of the 2016-2017 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 98-99.

- 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

<table>
<thead>
<tr>
<th>Support Courses</th>
<th>Required Hours</th>
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<tbody>
<tr>
<td>MCOM 1113</td>
<td>Fundamentals of Speech</td>
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<tr>
<td>ENG 1113</td>
<td>English Composition</td>
</tr>
<tr>
<td>ENG 1213</td>
<td>English Composition and Research</td>
</tr>
</tbody>
</table>

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
- MATH 1513 College Algebra
- 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

**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

- **Support Courses** .................................................................. 9-15

**Computer Science .................................................................. 3**

- Required course:
  - CMSC 1513 Beginning Programming

**Science Education - Physical Science ......................... 28**

- **Required courses** .................................................................. 20

  - CHEM 2104 Quantitative Analysis and Lab
  - CHEM 3303 Organic Chemistry I
  - CHEM 3312 Organic Chemistry I Lab
  - CHEM 3403 Biochemistry I
  - CHEM 3442 Experimental Biochemistry
  - PHY 1304 Descriptive Astronomy
  - ENGR 1112 Introduction to Engineering and Lab

- **Elective Science ................................................................. 8**

  - Select from the following:
    - CHEM 3323 Organic Chemistry II
    - CHEM 3332 Organic Chemistry II Laboratory
    - CHEM 3203 Introductory Physical Chemistry
    - *ENGR 2303 Electrical Science
    - *ENGR 2311 Electrical Science Lab
    - *ENGR 3403 Analog Electronics
    - *ENGR 3421 Analog Electronics Laboratory
    - PHY 4910 Seminar in Physics (1 - 3 hours)

  - * Students choosing to take PHY 1114 and PHY 1214 Gen Physics I & II can only take CHEM courses within the Elective Science due to prerequisites. To take Engineering courses, students must take PHY 2014 Physics for Scientist and Engineers I and Lab and PHY 2114 Physics for Scientist and Engineers II and Lab. PHY 2014 and 2114 have MATH 2313, 2323 and 2333 as prerequisites.

**Professional Education .................................................... 31**

  - PTE 1010 Introduction to Teacher Education
  - PTE 3023 Foundations of American Education/Clinical Exp
  - PTE 3153 Adolescent Psychology
  - SPED 4123 Teaching Individuals with Disabilities
  - "BIO 4812 Teaching and Learning in Science Classrooms
  - "BIO 4853 General Methods of Teaching Science and Lab
  - "PTE 4172 Educational Assessment

- 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 -

^PTE 4533 Educational Psych/Clinical Experience
^#PTE 4811 Contemporary Issues
^#PTE 4838 Internship/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. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major)........ “C”
3. Proficiency in foreign language ........................................ Novice 4 level

For other regulations pertaining to graduation, see pages 69-70 of the 2016-2017 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 98-99.  
• 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

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 Physics 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 - Physics .........................62
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

Computer Science ............................................. 3

Required course:
  CMSC 1513  Beginning Programming

Life Skills ........................................................ 5

Required Health Course...................................... 2

• Elective Life Skills........................................... 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

Math Courses ....................................................... 15

MATH 2313  Calculus 1
MATH 2323  Calculus 2
MATH 2333  Calculus 3
MATH 2343  Calculus 4
MATH 3103  Differential Equations

Physics and Engineering Courses ....................... 13

ENGR 2033  Statics
ENGR 2043  Dynamics
ENGR 3303  Engineering Probability and Statistics
ENGR 2303  Electrical Science
ENGR 2311  Electrical Science Lab

Professional Education .................................31

PTE 1010  Introduction to Teacher Education
PTE 3023  Foundations of American Education/Clinical Exp
PTE 3153  Adolescent Psychology
SPED 4123  Teaching Individuals with Disabilities
'BIO 4812  Teaching and Learning in Science Classrooms
'BIO 4853  General Methods of Teaching Science and Lab
'PTE 4172  Educational Assessment
'PTE 4533  Educational Psych/Clinical Experience
'PTE 4838  Internship/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.

- CONTINUED ON NEXT PAGE -
Minimum Graduation Requirements

1. Overall GPA in all college course work ........................................ 2.75
2. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major) ....... “C”
3. Proficiency in foreign language ........................................ Novice 4 level

For other regulations pertaining to graduation, see pages 69-70 of the 2016-2017 catalog.
Program: Software Engineering
Major: Software Engineering
Degree: Bachelor of Science (B.S.)

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 98-99.
* 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

Support Courses

Students majoring in Software Engineering 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

* A grade of ‘C’ or better is required for both MATH 1513 and 1593 to take MATH 2313.

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

Software Engineering ..................................................................................... 77-80

Required ........................................................................................................... 53
^CMSC 1613 Programming I
^CMSC 1621 Programming I Laboratory
^CMSC 2123 Discrete Structures
^CMSC 2613 Programming II
^CMSC 2833 Computer Organization I
^SE 3103 Object Oriented Software Design and Construction
^CMSC 3613 Data Structures and Algorithms
^CMSC 4003 Applications of Database Management Systems
^CMSC 4153 Operating Systems
^SE 4283 Software Engineering I
^CMSC 4401 Ethics in Computing
^SE 4423 Software Engineering II
^SE 4433 Software Architecture and Design
^SE 4513 Software Engineering Senior Project *
^MATH 2313 Calculus I
^MATH 2323 Calculus II
^MATH 2333 Calculus III
^MATH 3143 Linear Algebra
^STAT 2113 Statistical Methods OR

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

Elective Science/Math courses ................................................................. 9-12

Select a minimum of nine (9) hours including at least one of the CHEM or PHY lab courses:

CHEM 1103 General Chemistry I
CHEM 1112 General Chemistry I Recitation/Laboratory
CHEM 1223 General Chemistry II
CHEM 1232 General Chemistry II Recitation/Laboratory
PHY 1114 General Physics I and Laboratory
PHY 1214 General Physics II and Laboratory
PHY 2014 Physics for Scientists & Engineers I and Lab
PHY 2114 Physics for Scientists & Engineers II and Lab
PHY 2114 General Physics II and Laboratory

Any 2/3/4000 level MATH or STAT courses with the following exceptions: MATH 2053, 2113, 2123, 2133, 2153, 2743, 3232, or 4843.

Elective Courses ................................................................................................. 9

Choose nine (9) hours from one of the two application areas:

Application Development
  CMSC 3413 Enterprise Programming
  CMSC 4133 Concepts of Artificial Intelligence
  CMSC 4303 Mobile Apps Programming
  CMSC 4373 Web Server Programming

System Development
  CMSC 4023 Programming Languages
  CMSC 4063 Networks
  CMSC 4173 Translator Design
  CMSC 4193 Introduction to Robotics
  CMSC 4323 Computer and Network Security

- CONTINUED ON NEXT PAGE -
Program: Software Engineering  
Major: Software Engineering  
Degree: Bachelor of Science (B.S.)  
Dept: Computer Science  
College: Mathematics and Science  
Major Code: 6110

- CONTINUED FROM PREVIOUS PAGE -

Elective CMSC or SE Courses........................................................... 6
Any 3/4000 level CMSC or SE courses except CMSC 4513
Any programming labs (CMSC 2621 or 3621)

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

Credit cannot be received for both CMSC 3303 and SE 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 69-70 of the 2016-2017 catalog.