College of Mathematics and Science

Academic Degree Programs,
Minors and Certificate
Program: Actuarial Science
Major: Actuarial Science
Degree: Bachelor of Science (B.S.)

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

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
* 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

Prerequisite Courses ................................................................. 0-6
Required courses:
  MATH 1533 Algebra for STEM OR Placement Score AND
  MATH 1593 Plane Trigonometry OR Placement Score

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 4113 Mathematical Statistics 1
  *# STAT 4123 Mathematical Statistics 2
  # STAT 4213 Applied Regression Analysis
  # STAT 4533 Data Mining & Statistical Learning

Finance and Insurance Electives .................................................. 15
Select from the following:
  * ACCT 2113 Accounting 1
  * ECON 2103 Principles of Microeconomics
  * ECON 2203 Principles of Macroeconomics
  FIN 3523 Foundations of Insurance and Risk Management
  FIN 3553 Property and Liability Insurance for the Firm

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

FIN 3563 Fundamentals of Business Finance
FIN 3613 Life and Health Insurance
* FIN 4253 Intermediate Business Finance
FIN 4213 Investments

Area of Application ....................................................................... 6
Select from the following:
  MATH 3103 Differential Equations
  MATH 4113 Operations Research 1
  MATH 4123 Operations Research 2
  MATH 4263 Numerical Linear Algebra
  MATH 4363 Applied Numerical Analysis
  MATH 4950 Internship (3 hours)
  STAT 4103 Applied Experimental Design
  STAT 4313 Nonparametric Statistics

* These courses are accredited by the Society of Actuaries to earn Validation by Educational Experience (VEE) credits.
# These courses will help prepare students for the professional examinations administered by the Society of Actuaries. See the Director of Actuarial Studies in MCS 108 for more details.

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

Minimum Grade Requirements

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

For other regulations pertaining to graduation, see pages 68-69 of the 2018-2019 catalog.
Biology

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
- 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 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 (required of all degree candidates) ......................... 26

Required Courses:
  BIO 1204 Biology for Majors: Principles
  BIO 1225 Biology for Majors: Diversity
  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

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)*** .............. 16
  ** 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

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 68-69 of the 2018-2019 catalog.
Program: Biology
Major: Biology-Biomedical Sciences
Degree: Bachelor of Science (B.S.)

Dept: Biology
College: Mathematics and Science
Major Code: 6001

University Core (Total Listed 42-44)

- Specific courses within the University Core are listed on pages 96-97.
- Courses from the major may apply to the areas marked in the University Core.
- Minimum Required Hours: 3
- University Core: (Total Listed 42-44)

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 for Majors: Principles
  BIO 1225 Biology for Majors: Diversity
  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
  - Cultural Analysis ............................................................ 3

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

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

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 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 -
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.

Minimum Hours required ....................... 125*

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, physics, and two years of a second language in high school. 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 68-69 of the 2018-2019 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.)
### University Core (Total Listed 42-44)

<table>
<thead>
<tr>
<th>Minimum Required Hours</th>
<th>Support Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>Student majoring in Biology-Medical Laboratory Science are encouraged to complete the following courses in high school.</td>
</tr>
<tr>
<td></td>
<td>Two years of high school algebra OR MATH 1513 College Algebra</td>
</tr>
</tbody>
</table>

#### Major Requirements

**Biology-Medical Laboratory Sciences**

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**

Required Courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 1204</td>
<td>Biology for Majors: Principles</td>
</tr>
<tr>
<td>BIO 1225</td>
<td>Biology for Majors: Diversity</td>
</tr>
<tr>
<td>BIO 2203</td>
<td>Cell Biology</td>
</tr>
<tr>
<td>BIO 2211</td>
<td>Cell Biology Laboratory</td>
</tr>
<tr>
<td>BIO 2604</td>
<td>Human Physiology and Lab</td>
</tr>
<tr>
<td>BIO 3054</td>
<td>Microbiology for Majors and Lab</td>
</tr>
<tr>
<td>BIO 3303</td>
<td>Genetics</td>
</tr>
<tr>
<td>BIO 4515</td>
<td>Pathogenic Microbiology and Immunology and Lab</td>
</tr>
<tr>
<td>CHEM 1103</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CHEM 1112</td>
<td>General Chemistry I-Recitation/Lab</td>
</tr>
<tr>
<td>CHEM 1223</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>CHEM 1232</td>
<td>General Chemistry II-Recitation/Lab</td>
</tr>
<tr>
<td>CHEM 3303</td>
<td>Organic Chemistry I</td>
</tr>
<tr>
<td>CHEM 3312</td>
<td>Organic Chemistry I Lab</td>
</tr>
<tr>
<td>CHEM 3403</td>
<td>Biochemistry I</td>
</tr>
</tbody>
</table>

**Mathematics**

Required courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 2153</td>
<td>BioCalculus</td>
</tr>
<tr>
<td>STAT 2103</td>
<td>Intro Statistics for Sciences</td>
</tr>
</tbody>
</table>

**Elective Biology and/or Chemistry**

Selected from the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 3403</td>
<td>Comparative Animal Physiology OR</td>
</tr>
<tr>
<td>BIO 3464</td>
<td>Comparative Animal Physiology and Lab</td>
</tr>
<tr>
<td>BIO 3414</td>
<td>Histology and Lab</td>
</tr>
</tbody>
</table>

### American Historical and Political Analysis

- American Historical Analysis: 3
- American National Government Analysis: 6

### Cultural and Language Analysis

- Cultural Analysis: 3
- Second Language Analysis: 4
- American Historical and Political Analysis: 3

### Social and Behavioral Analysis

- Life Skills: 5
- Elective Life Skills: 3

## 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 68-69 of the 2018-2019 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)

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)
*MATH 1533 Algebra for STEM OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for both MATH 1533 and 1593 to take MATH 2313.

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

One year High School Physics OR
PHY 1003 Introduction to Physics

Major Requirements

Biomedical Engineering ........................................ 96-98

Biology ........................................................................ 11
Required courses:
BIO 1204 Biology for Majors: Principles
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 Biomechanics
BME 3113 Principles of Biomedical Engineering

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 Science and Engineering I and
Laboratory
^PHY 2114 Physics for Science and Engineering 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.

- CONTINUED ON NEXT PAGE -
Minimum Required Hours

- CONTINUED FROM PREVIOUS PAGE -

Complete all the courses from one of the following concentrations:

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

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 (for Concentration A)
#ENGR 3183 Electromagnetic Fields I (for Concentration B)

# 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 68-69 of the 2018-2019 catalog.

Admission into Engineering and Physics Upper Division

Students seeking the B.S. in Biomedical Engineering, Electrical Engineering, 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 Electrical Engineering, Mechanical Engineering, and Engineering Physics - 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: Chemistry  
Major: Chemistry  
Degree: Bachelor of Science (B.S.)  

University of Central Oklahoma Undergraduate Catalog 2018-2019

Minimum Required Hours

University Core  (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
• 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 1533 Algebra for STEM OR Placement Score AND
MATH 1593 Plane Trigonometry OR Placement Score

A grade of ‘C’ or better is required for both MATH 1533 and 1593 to take MATH 2313.

Major Requirements

Chemistry ................................................................. 68

Common Core .......................................................... 47
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
MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
PHY 2014 Physics for Science and Engineering I and Lab
PHY 2114 Physics for Science and Engineering II and Lab

Advanced Chemistry ......................................................... 21
Required courses: ......................................................... 12
CHEM 3503 Physical Chemistry I
CHEM 3513 Physical Chemistry II
CHEM 3602 Experimental Physical Chemistry
CHEM 4502 Directed Research and Lab (taken twice)
Chemistry Electives ......................................................... 9
(3000/4000 level; CHEM 3203 will not apply)

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

The following are highly recommended:
CHEM 3403 Biochemistry I
CHEM 4454 Advanced Instrumental Analysis and Lab
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 68-69 of the 2018-2019 catalog.
Program: Chemistry  
Major: Chemistry - ACS Certificate  
Degree: Bachelor of Science (B.S.)

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

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

Specific courses within the University Core are listed on pages 96-97.

- 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>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support Courses</td>
<td>0-6</td>
</tr>
</tbody>
</table>

Required Courses:
- MATH 1533 Algebra for STEM OR Placement Score AND MATH 1593 Plane Trigonometry OR Placement Score

A grade of ‘C’ or better is required for both MATH 1533 and 1593 to take MATH 2313.

**Major Requirements**

**Chemistry - ACS Certificate** ................................................................. 76

**Common Core** ..................................................................................... 47

<table>
<thead>
<tr>
<th>Required courses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1103</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CHEM 1112</td>
<td>General Chemistry I - Recitation/Lab</td>
</tr>
<tr>
<td>CHEM 1223</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>CHEM 1232</td>
<td>General Chemistry II - Recitation/Lab</td>
</tr>
<tr>
<td>CHEM 2104</td>
<td>Quantitative Analysis and Lab</td>
</tr>
<tr>
<td>CHEM 2621</td>
<td>Professionalism in Chemistry I</td>
</tr>
<tr>
<td>CHEM 3303</td>
<td>Organic Chemistry I</td>
</tr>
<tr>
<td>CHEM 3312</td>
<td>Organic Chemistry I Lab</td>
</tr>
<tr>
<td>CHEM 3323</td>
<td>Organic Chemistry II</td>
</tr>
<tr>
<td>CHEM 3332</td>
<td>Organic Chemistry II Lab</td>
</tr>
<tr>
<td>CHEM 3454</td>
<td>Fundamentals of Instrumental Analysis and Lab</td>
</tr>
<tr>
<td>CHEM 3621</td>
<td>Professionalism in Chemistry II</td>
</tr>
<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>PHY 2014</td>
<td>Physics for Science and Engineering I and Lab</td>
</tr>
<tr>
<td>PHY 2114</td>
<td>Physics for Science and Engineering II and Lab</td>
</tr>
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</table>

**Advanced Chemistry ACS approved** ....................................................... 29

<table>
<thead>
<tr>
<th>Required courses</th>
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</thead>
<tbody>
<tr>
<td>CHEM 3403</td>
<td>Biochemistry I</td>
</tr>
<tr>
<td>CHEM 3503</td>
<td>Physical Chemistry I</td>
</tr>
<tr>
<td>CHEM 3513</td>
<td>Physical Chemistry II</td>
</tr>
<tr>
<td>CHEM 3602</td>
<td>Experimental Physical Chemistry</td>
</tr>
<tr>
<td>CHEM 4502</td>
<td>Directed Research and Lab (taken twice)</td>
</tr>
<tr>
<td>CHEM 4603</td>
<td>Advanced Organic Chemistry</td>
</tr>
<tr>
<td>CHEM 4654</td>
<td>Inorganic Chemistry and Lab</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
- OR
- Cultural Analysis .............................................................................. 3

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

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

<table>
<thead>
<tr>
<th>Required Health Course</th>
<th>Elective Life Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>................................</td>
<td>2</td>
</tr>
<tr>
<td>................................</td>
<td>3</td>
</tr>
</tbody>
</table>

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

The following are highly recommended:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 4454</td>
<td>Advanced Instrumental Analysis and Lab</td>
</tr>
<tr>
<td>ENG 4023</td>
<td>Technical Writing</td>
</tr>
<tr>
<td>MATH 2343</td>
<td>Calculus 4</td>
</tr>
<tr>
<td>PHY 3103</td>
<td>Modern Physics</td>
</tr>
</tbody>
</table>

**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 68-69 of the 2018-2019 catalog.
Program: Chemistry  
Major: Chemistry - Health Sciences  
Degree: Bachelor of Science (B.S.)

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

Specific courses within the University Core are listed on pages 96-97.

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

<table>
<thead>
<tr>
<th>Specific Course Area</th>
<th>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written and Oral Communication</td>
<td>9</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>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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Core Area</th>
<th>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<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>
</tr>
<tr>
<td>Cultural and Language Analysis</td>
<td>3-4</td>
</tr>
<tr>
<td>Second Language</td>
<td>4</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<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

<table>
<thead>
<tr>
<th>Required Courses:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 1513 College Algebra OR</td>
<td></td>
</tr>
<tr>
<td>MATH 1533 Algebra for STEM OR Placement Score</td>
<td></td>
</tr>
<tr>
<td>AND</td>
<td></td>
</tr>
<tr>
<td>MATH 1593 Plane Trigonometry OR Placement Score</td>
<td></td>
</tr>
</tbody>
</table>

**Major Requirements**

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

| Common Core                                             | 56                    |

<table>
<thead>
<tr>
<th>Required courses:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1103 General Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CHEM 1112 General Chemistry I Recitation/Lab</td>
<td></td>
</tr>
<tr>
<td>CHEM 1223 General Chemistry II</td>
<td></td>
</tr>
<tr>
<td>CHEM 1232 General Chemistry II Recitation/Lab</td>
<td></td>
</tr>
<tr>
<td>CHEM 2104 Quantitative Analysis and Lab</td>
<td></td>
</tr>
<tr>
<td>CHEM 2621 Professionalism in Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CHEM 3303 Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CHEM 3312 Organic Chemistry I Lab</td>
<td></td>
</tr>
<tr>
<td>CHEM 3323 Organic Chemistry II</td>
<td></td>
</tr>
<tr>
<td>CHEM 3332 Organic Chemistry II Lab</td>
<td></td>
</tr>
<tr>
<td>CHEM 3454 Fundamentals of Instrumental Analysis and Lab</td>
<td></td>
</tr>
<tr>
<td>CHEM 3621 Professionalism in Chemistry II</td>
<td></td>
</tr>
<tr>
<td>BIO 1204 Biology for Majors: Principles</td>
<td></td>
</tr>
<tr>
<td>BIO 1225 Biology for Majors: Diversity</td>
<td></td>
</tr>
<tr>
<td>BIO 2203 Cell Biology</td>
<td></td>
</tr>
<tr>
<td>MATH 2153 Bio-Calculus</td>
<td></td>
</tr>
<tr>
<td>PHY 1114 General Physics I and Lab</td>
<td></td>
</tr>
<tr>
<td>PHY 1214 General Physics II and Lab</td>
<td></td>
</tr>
<tr>
<td>STAT 2103 Intro Statistics for Sciences</td>
<td></td>
</tr>
</tbody>
</table>

| Advanced Course work ................................................... 20 |

<table>
<thead>
<tr>
<th>Required courses:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 3054 Microbiology for Majors and Lab</td>
<td></td>
</tr>
<tr>
<td>CHEM 3203 Introductory Physical Chemistry</td>
<td></td>
</tr>
<tr>
<td>CHEM 3403 Biochemistry I</td>
<td></td>
</tr>
</tbody>
</table>

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 68-69 of the 2018-2019 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 96-97.
- 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 course in high school.

Advanced Placement High School Programming Course OR
CMSC 1513 Beginning Programming

* MATH 1533 Algebra for STEM OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for both MATH 1533 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 ...............................................................80-81

Required .............................................................................. 59
^ 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 3833 Computer Organization II
^ CMSC 4003 Applications of Database Management Systems
^ CMSC 4023 Programming Languages OR
^ CMSC 4173 Translator Design
^ CMSC 4153 Operating Systems
^ CMSC 4273 Theory of Computing
^ SE 4283 Software Engineering I
^ CMSC 4323 Computer and Network Security
^ CMSC 4401 Ethics in Computing
^CMSC 4513 Software Design and Development
^ MATH 2313 Calculus I

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 Course ............................................................. 3

Minimum Required Hours

^ MATH 2323 Calculus 2
^ MATH 2333 Calculus 3
^ MATH 3143 Linear Algebra
^ STAT 2113 Statistical Methods OR
  ^ STAT 2103 Introduction to Statistics for Sciences OR
  ^ STAT 4113 Mathematical Statistics I

^ 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 Science Courses ..................................................... 4-5
PHY 1114 General Physics I and Laboratory OR
PHY 2014 Physics for Sci & Engineering I and Lab OR
CHEM 1103 General Chemistry I AND
CHEM 1112 General Chemistry I Recitation/Laboratory

Elective CMSC or SE courses .................................................. 17
Select 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.

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

- CONTINUED ON NEXT PAGE -
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 68-69 of the 2018-2019 catalog.
Computer Science - Applied

Required

^ 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 Systems Analysis and Design OR
^ SE 4283 Software Engineering I
^ CMSC 3613 Data Structures and Algorithms
^ CMSC 4003 Applications of Database Management Systems
^ CMSC 4023 Programming Languages OR
^ CMSC 4173 Translator Design
^ CMSC 4153 Operating Systems
^ CMSC 4401 Ethics in Computing
^ CMSC 4513 Software Design and Development
^ MATH 2313 Calculus I
^ MATH 2323 Calculus II
^ STAT 2113 Statistical Methods OR

Teacher: 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 96-97.
• 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

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

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

Advanced Placement High School Programming Course OR
CMSC 1513 Beginning Programming OR
*MATH 1533 Algebra for STEM OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for both MATH 1533 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

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

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.

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.

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.

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

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

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.

- 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

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

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

A high school computer technology course using a word processor, spreadsheet, e-mail, browser, and search engines OR
CMSC 1053 Professional Computer Applications and Problem Solving
Advanced Placement High School Programming Course OR
CMSC 1513 Beginning Programming

* MATH 1533 Algebra for STEM OR Placement Score AND
* MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for both MATH 1533 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........... 80

Required................................................................. 65
  ^ CMSC 1613 Programming I
  ^ CMSC 1621 Programming I Laboratory
  ^ CMSC 2123 Discrete Structures
  ^ CMSC 2413 Visual Programming
  ^ CMSC 2613 Programming II
  ^ CMSC 2833 Computer Organization I
  ^ SE 3103 Object Oriented Software Design and Construction
  ^ CMSC 3303 Systems Analysis and Design
  ^ CMSC 3413 Enterprise Programming
  ^ CMSC 3613 Data Structures and Algorithms
  ^ CMSC 4003 Applications of Database Management Systems
  ^ CMSC 4063 Networks
  ^ CMSC 4153 Operating 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

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 pages 68-69 of the 2018-2019 catalog.
Program: Electrical Engineering
Major: Electrical Engineering
Degree: Bachelor of Science (B.S.)

Dept: Engineering and Physics
College: Mathematics and Sciences
Major Code: 6260

University Core  (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97. 
* 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 .............................................. 3-11
  • Life Science ..................................... 4
  • Physical Science .................................. 3-4
Critical Inquiry and Aesthetic Analysis ............................... 6
  Aesthetic Analysis ................................... 3
  • Critical Inquiry .................................. 3

Support Courses

<table>
<thead>
<tr>
<th>Support Courses</th>
<th>Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 1123</td>
<td>Contemporary Moral Problems</td>
</tr>
<tr>
<td>ECON 1103</td>
<td>Introduction to Economics</td>
</tr>
<tr>
<td>FMKT 2323</td>
<td>Global Protocol and Diversity</td>
</tr>
<tr>
<td>*MATH 1533</td>
<td>Algebra for STEM OR Placement Score AND</td>
</tr>
<tr>
<td>*MATH 1593</td>
<td>Plane Trigonometry OR Placement Score</td>
</tr>
</tbody>
</table>

* A grade of ‘C’ or better is required for both MATH 1533 and 1593 to take MATH 2313.

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

One year of high school physics OR

<table>
<thead>
<tr>
<th>Subject</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>1003</td>
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</table>

Introduction to Physics

Major Requirements

Electrical Engineering .................................................. 92

<table>
<thead>
<tr>
<th>Subject</th>
<th>Course</th>
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<tbody>
<tr>
<td>PHYS</td>
<td>2014</td>
</tr>
<tr>
<td>PHYS</td>
<td>2114</td>
</tr>
<tr>
<td>PHYS</td>
<td>3103</td>
</tr>
<tr>
<td>PHYS</td>
<td>3883</td>
</tr>
</tbody>
</table>

Physics for Science and Engineering I and Lab
Physics for Science and Engineering II and Lab
Modern Physics
Mathematical Physics I

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 3183 Electromagnetic Fields I
ENGR 3223 Digital Logic Design and Laboratory
ENGR 3303 Engineering Probability & Statistics
*ENGR 3323 Signals and Systems
ENGR 3331 Signals and Systems 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

ENGR 3403 Analog Electronics
ENGR 3421 Analog Electronics Laboratory
#ENGR 3413 Materials Science
ENGR 3613 Microprocessors and Laboratory
ENGR 3703 Computational Methods in Engineering
ENGR 3803 Electrical Power Systems
#ENGR 4323 Digital and Analog Communication
#ENGR 4333 Digital Signal Processing
ENGR 4351 Digital Signal Processing Laboratory
#ENGR 4803 Mechatronics & Laboratory
#ENGR 4882 Senior Engineering Design I
#ENGR 4892 Senior Engineering Design II

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

Required courses:

CHEM 1315 Chemistry for Engineering and Lab

Guided Engineering Electives .......................................... 3

Select from the following:

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

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

# Admission into Engineering and Physics Upper Division is required.

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

- CONTINUED FROM PREVIOUS PAGE -

Minimum Hours required ...................... 125*

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, physics and two years of a second language in high school.

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 68-69 of the 2018-2019 catalog.

Admission into Engineering and Physics Upper Division

Students seeking the B.S. in Biomedical Engineering, Electrical Engineering, Engineering Physics – Physics and Mechanical Engineering 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 96-97.  
* 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 .......................................................... 9-18
PHIL  1123 Contemporary Moral Problems
ECON  1103 Introduction to Economics
FMKT  2323 Global Protocol and Diversity
(or Foreign Language)
*MATH  1533 Algebra for STEM OR Placement Score AND
*MATH  1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for both MATH 1533 and 1593 to take MATH 2313.

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

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 Science and Engineering I and Lab
PHY   2114 Physics for Science and Engineering 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

Length of Program: 4 years

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
  OR
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.

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

- CONTINUED FROM PREVIOUS PAGE -

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

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, physics and two years of a second language in high school.

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 68-69 of the 2018-2019 catalog.

Admission into Engineering and Physics Upper Division

Students seeking the B.S. in Biomedical Engineering, Electrical Engineering, Engineering Physics – Physics and Mechanical Engineering 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: 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 96-97.
* 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

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 68-69 of the 2018-2019 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

National Board Examination scores, graduation rates, and employment rates for this and other ABFSE-accredited programs are available at www.abfse.org. To request a printed copy of this program’s scores and rates, go to: UCO Department of Funeral Service, CHS 154, 100 North University Drive, Edmond, OK  73034 or by e-mail at funeralservice@uco.edu, or by telephone, (405) 974-5001.

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
Minimum Required Hours

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
• 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

Prerequisite Courses

Prerequisite Courses ..................................................0-6

MATH 1533 Algebra for STEM OR Placement Score AND
MATH 1593 Plane Trigonometry OR Placement Score

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 68-69 of the 2018-2019 catalog.

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.
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 96-97.
• 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

Prerequisite Courses

Prerequisite Courses..................................................0-6

MATH 1533 Algebra for STEM OR Placement Score AND
MATH 1593 Plane Trigonometry OR Placement Score

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.

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 68-69 of the 2018-2019 catalog.
Program: Mathematics
Major: Mathematics - Statistics
Degree: Bachelor of Science (B.S.)
Dept: Mathematics and Statistics
College: Mathematics and Science
Major Code: 6162

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
• 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
Sd Language ......................................................................4
OR
Cultural Analysis ............................................................3
Social and Behavioral Analysis ............................................3
Life Skills ........................................................................5
Required Health Course.....................................................2
Elective Life Skills ............................................................3

Prerequisite Courses

MATH 1533 Algebra for STEM OR Placement Score AND
MATH 1593 Plane Trigonometry OR Placement Score

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

Major Requirements

Mathematics - Statistics .............................................54
The following courses ..........................................................30
Required .................................................................27
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

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 68-69 of the 2018-2019 catalog.
Program: Mathematics Education  
Major: Mathematics Education  
Degree: Bachelor of Science in Education (B.S.Ed.)

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

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97. 
• 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 and Prerequisite Courses

Support Courses............................................................................. 9
MCOM 1113 Fundamentals of Speech
ENG 1113 English Composition
ENG 1213 English Composition and Research

Prerequisite Courses........................................................................ 0-6
MATH 1533 Algebra for STEM OR Placement Score AND
MATH 1593 Plane Trigonometry OR Placement Score

Major Requirements

Mathematics Education................................................................. 41-42

Required courses ............................................................................ 36
MATH 2123 Survey of Discrete for Math Education
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 OR
MATH 3183 Introduction to Modern Algebra
MATH 4483 History of Mathematics
STAT 2113 Statistical Methods

Mathematics Electives ..................................................................... 5-6
Select at least two of the following:
MATH 2023 Foundations of Geometry and Measurement
MATH 3103 Differential Equations
MATH 4143 Introduction to Analysis 1
MATH 4960 Institute in Mathematics (2 hours)
STAT 4113 Mathematical Statistics 1

Professional Education ................................................................. 32
PTE 1010 Introduction to Teacher Education
PTE 3023 Foundations of American Education/Clinical Exp

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 Graduation Requirements

1. Overall GPA in all college course work .................................. 2.50
2. Average in course work at UCO ........................................... 2.00
3. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major)........ “C”
4. Proficiency in foreign language .............................................. Novice 4 level

For other regulations pertaining to graduation, see pages 68-69 of the 2018-2019 catalog.
Program: Mechanical Engineering
Major: Mechanical Engineering
Degree: Bachelor of Science (B.S.)

Department: Engineering and Physics
College: Mathematics and Science
Major Code: 6270

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
- 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)
*MATH 1533 Algebra for STEM OR Placement Score
*MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for both MATH 1533 and 1593 to take MATH 2313.

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

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

Major Requirements

Mechanical Engineering ......................................................... 94

Physics .............................................................................. 11
- Required courses:
  PHY 2014 Physics for Science and Engineering I and Lab
  PHY 2114 Physics for Science and Engineering II and Lab
  PHY 3883 Mathematical Physics I

Engineering ......................................................................... 57
- Required courses:
  ENGR 1112 Introduction to Engineering and Laboratory
  ENGR 1213 Engineering Computing and Laboratory
  ENGR 2033 Statics
  ENGR 2043 Dynamics
  ENGR 2143 Strength of Materials
  ENGR 2151 Strength of Materials Lab
  ENGR 2303 Electrical Science
  ENGR 2311 Electrical Science Laboratory
  ENGR 3203 Thermodynamics
  ENGR 3211 Thermal Engineering 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
  OR
  Second Language ........................................................... 4
  Cultural Analysis ............................................................ 3

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

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

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

- CONTINUED FROM PREVIOUS PAGE -

Minimum Hours required …………………... 127*

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, physics and two years of a second language in high school.

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 68-69 of the 2018-2019 catalog.

Admission into Engineering and Physics Upper Division

Students seeking the B.S. in Biomedical Engineering, Electrical Engineering, Engineering Physics – Physics and Mechanical Engineering 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: Nursing
Major: Nursing
Degree: Bachelor of Science (B.S.)

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

University Core  (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
• 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

Major Requirements

Nursing ............................................................................................ 98

The baccalaureate degree in nursing at UCO is accredited by the Commission on Collegiate Nursing Education (http://www.ccneaccreditation.org). Graduates of this state approved program are eligible to apply to write the National Council Licensure Examination (NCLEX-RN) for registered nurses.

Pre-Professional ............................................................................. 39

The following courses:
CHEM 1014 Introductory Chemistry and Lab
BIO 1114 General Biology OR
BIO 1204 Biology for Majors: Principles
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 .................................................................................... 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

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

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

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete two years of a second language in high school.

- 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 83 on the internet version or equivalent on the written examination (560).

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.

Accelerated RN-MS

A tailored, accelerated RN-MS option is offered to qualifying RN-BS students. Students who are accepted to the RN to BS degree option may take three specified 5000-level NURS courses (9 credit hours) during the senior year of the BS program. These courses will count towards both the BS and MS degrees. Formal application and department permission is required. Specifics of the requirements are located in the UCO Graduate Catalog under Nursing: Master of Science (M.S.).

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

<table>
<thead>
<tr>
<th>Degree: Bachelor of Science in Education (B.S.Ed.)</th>
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<tbody>
<tr>
<td>College: Mathematics and Science</td>
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<tr>
<td>Major: Mathematics and Science</td>
</tr>
<tr>
<td>Major Code: 6040</td>
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**University Core** *(Total Listed 42-44)*

Specific courses within the University Core are listed on pages 96-97.

- 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>
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</thead>
<tbody>
<tr>
<td>Support Courses: 9-15</td>
</tr>
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</table>

**Support Courses**

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

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

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

**Major Requirements**

**Science Education - Biology: 65**

**Biology: 26**

- Required courses:
  - BIO 1204 Biology for Majors: Principles
  - BIO 1225 Biology for Majors: Diversity
  - BIO 2203 Cell Biology
  - BIO 2211 Cell Biology Laboratory
  - BIO 3054 Microbiology for Majors and Lab
  - BIO 3303 Genetics
  - BIO 3543 General Microbiology
  - BIO 3703 Evolution

**Chemistry: 10**

- Required courses:
  - CHEM 1103 General Chemistry I AND
  - CHEM 1112 General Chemistry 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 Science and Engineering I and Lab
  - PHY 1214 General Physics II and Lab OR
  - PHY 2114 Physics for Science and Engineering II and Lab

<table>
<thead>
<tr>
<th>Minimum Required Hours</th>
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<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>
<tr>
<td>Cultural and Language Analysis: 3-4</td>
</tr>
<tr>
<td>Second Language: 4 OR</td>
</tr>
<tr>
<td>Cultural Analysis: 3</td>
</tr>
<tr>
<td>Social and Behavioral Analysis: 3</td>
</tr>
<tr>
<td>Life Skills: 5</td>
</tr>
<tr>
<td>Required Health Course: 2</td>
</tr>
<tr>
<td>Elective Life Skills: 3</td>
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</table>

**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 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

**Minimum Hours required: 128**

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, and two years of a second language in high school.*
Program: Science Education - continued
Major: Science Education - Biology
Degree: Bachelor of Science in Education (B.S.Ed.)
Dept: Biology
College: Mathematics and Science
Major Code: 6040

- CONTINUED FROM PREVIOUS PAGE -

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 ........................................2.50
2. Average in course work at UCO ..............................................2.00
3. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major)........ “C”
4. Proficiency in foreign language .......................... Novice 4 level

For other regulations pertaining to graduation, see pages 68-69 of the 2018-2019 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 96-97.
• 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 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 AND
MATH 1593 Plane Trigonometry

Major Requirements

Science Education - Chemistry ........................................... 65

Science Education Core ......................................................... 37

Biology .................................................................................. 9
Required courses:
BIO 1204  Biology for Majors: Principles
BIO 1225  Biology for Majors: Diversity

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 Science and Engineering I and Lab
PHY 1214  General Physics II and Lab OR
PHY 2114  Physics for Science and Engineering 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

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

Minimum Hours required ................................................. 128*

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, and two years of a second language in high school.

- CONTINUED ON NEXT PAGE -
Program: Science Education - continued
Major: Science Education - Chemistry
Degree: Bachelor of Science in Education (B.S.Ed.)

- CONTINUED FROM PREVIOUS PAGE -

Minimum Graduation Requirements
1. Overall GPA in all college course work .................. 2.50
2. Average in course work at UCO ............................. 2.00
3. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major) .... “C”
4. Proficiency in foreign language ............................ Novice 4 level

For other regulations pertaining to graduation, see pages 68-69 of the 2018-2019 catalog.
University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.

- 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

MCOM 1113 Fundamental 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 AND
- MATH 1593 Plane Trigonometry

Major Requirements

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

Science Education Core .......................................................... 34

- Biology .................................................................................................. 9
  Required courses:
  BIO 1204 Biology for Majors: Principles
  BIO 1225 Biology for Majors: Diversity

- 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 Science and Engineering I and Lab
  PHY 1214 General Physics II and Lab OR
  PHY 2114 Physics for Science and Engineering II and Lab

- Mathematics ....................................................................................... 3
  Required course:
  STAT 2103 Introduction to Statistics for Sciences

- Earth Science .................................................................................... 4
  Required course:
  PHY 3014 Earth Science

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

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

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

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 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

- CONTINUED ON NEXT PAGE -
Minimum Hours required …………………… 127*

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, and two years of a second language in high school.

Minimum Graduation Requirements
1. Overall GPA in all college course work ......................................... 2.50
2. Average in course work at UCO ............................................. 2.00
3. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major)........ “C”
4. Proficiency in foreign language ........................................... Novice 4 level

For other regulations pertaining to graduation, see pages 68-69 of the 2018-2019 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 96-97.
- 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Required Hours</th>
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</thead>
<tbody>
<tr>
<td>MCOM 1113</td>
<td>Fundamentals of Speech</td>
<td></td>
</tr>
<tr>
<td>ENG 1113</td>
<td>English Composition</td>
<td></td>
</tr>
<tr>
<td>ENG 1213</td>
<td>English Composition and Research</td>
<td></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 OR
- 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 for Majors: Principles
  - BIO 1225 Biology for Majors: Diversity

- 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

**Earth Science** ............................................. 4
- PHY 3014 Earth Science

**Elective Science** .......................................... 8
- Select from the following:
  - CHEM 3203 Introductory Physical Chemistry
  - *ENGR 2303 Electrical Science
  - *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 Science and Engineering I and Lab and PHY 2114 Physics for Science and Engineering II and Lab. PHY 2014 and 2114 have MATH 2313, 2323 and 2333 as prerequisites.

**American Historical and Political Analysis** ........... 6
- American National Government ......................... 3
- American History ............................................. 3

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

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

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

**Minimum Required Hours**

<table>
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<tr>
<th>Computer Science</th>
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<tr>
<td>CMSC 1513 Beginning Programming</td>
<td>3</td>
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</table>

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
- ENGR 1112 Introduction to Engineering and Lab

**Elective Science** .......................................... 8
- Select from the following:
  - CHEM 3203 Introductory Physical Chemistry
  - *ENGR 2303 Electrical Science
  - *ENGR 3403 Analog Electronics
  - *ENGR 3421 Analog Electronics Laboratory
  - PHY 4910 Seminar in Physics (1 - 3 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
- *PTE 4172 Educational Assessment

- CONTINUED ON NEXT PAGE -
Program: Science Education - continued
Dept: Engineering and Physics
Major: Science Education - Physical Science
College: Mathematics and Science
Degree: Bachelor of Science in Education (B.S.Ed.)
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

Minimum Hours required ...................... 128*

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, and two years of a second language in high school.

Minimum Graduation Requirements
1. Overall GPA in all college course work ......................... 2.50
2. Average in course work at UCO ................................................ 2.00
3. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major)........ “C”
4. Proficiency in foreign language .................. Novice 4 level

For other regulations pertaining to graduation, see pages 68-69 of the 2018-2019 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 96-97.  
* 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

*MATH 1533 Algebra for STEM OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for both MATH 1533 and 1593 to take MATH 2313.

Major Requirements

Science Education - Physics .............................................. 62

Science Education Core .................................................... 34
Biology .............................................................................. 9
  Required courses:
  BIO 1204 Biology for Majors: Principles
  BIO 1225 Biology for Majors: Diversity
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 Science and Engineering I and Lab
  PHY 2114 Physics for Science and Engineering II and Lab
Earth Science .................................................................... 4
  Required course:
  PHY 3014 Earth Science
Computer Science ............................................................. 3
  Required course:
  CMSC 1513 Beginning Programming

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 Hours required .................................................. 125*

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, and two years of a second language in high school.
- CONTINUED FROM PREVIOUS PAGE -

**Minimum Graduation Requirements**

1. Overall GPA in all college course work ......................... 2.50
2. Average in course work at UCO ........................................ 2.00
3. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major) .... “C”
4. Proficiency in foreign language ..................... Novice 4 level

For other regulations pertaining to graduation, see pages 68-69 of the 2018-2019 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 96-97.
* 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 .......................................................... 0-9

Students majoring in Software Engineering are encouraged to complete the following course in high school.

Advanced Placement High School Programming Course OR
CMSC 1513 Beginning Programming

*MATH 1533 Algebra for STEM OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for both MATH 1533 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
^SE 4283 Software Engineering I
^CMSC 4323 Computer and Network Security
^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 1
^MATH 2323 Calculus 2
^MATH 2333 Calculus 3
^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 Science & Engineering I and Lab
PHY 2114 Physics for Science & Engineering II and Lab

Any non-required 2/3/4000 level MATH or STAT courses with the following exceptions: MATH 2013, 2053, 2113, 2123, 2133, 2153, 2743, 3323, 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 4153 Operating Systems
CMSC 4173 Translator Design
CMSC 4193 Introduction to Robotics

- CONTINUED ON NEXT PAGE -
Minimum Required Hours

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

Elective CMSC or SE Courses........................................................... 6
  Any 3/4000 level CMSC or SE courses except CMSC 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 428.

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 68-69 of the 2018-2019 catalog.
College of Math and Science Minors

A minor is an optional component of a student’s degree (unless otherwise stated) that, upon graduation, will be reflected on the student’s transcript. A student may earn a minor or multiple minors in the same program, provided the minor differ at the major level. Minors may not be earned independently of a bachelor’s degree granted by the University of Central Oklahoma. Minors may not be earned as a part of an associate degree. Minors do not appear on diplomas.

Minimum Requirements for Minors

Minimums for minors unless otherwise specified:

- Total Hours ....................................................... 18
- Upper Division Hours (3/4000 level) ....................... 6
- Residency Hours .................................................. 6
- GPA ................................................................ 2.00

Biology

Biology .................................................................. 18-19

Minor Code: 6019

Required courses .................................................. 12

- BIO 1204 Biology for Majors: Principles
- BIO 1225 Biology for Majors: Diversity
- BIO 2203 Cell Biology

Elective Biology (upper division) ................................. 6-7

Select 2 courses from this list:
- BIO 3054 Microbiology for Majors
- BIO 3303 Genetics
- BIO 3543 General Ecology
- BIO 3703 Evolution

A grade of “C” or better is required in each course.

Chemistry

Chemistry ............................................................... 20

Minor Code: 6079

Required courses .................................................. 14

- 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

Elective Chemistry (3/4000 level) ................................ 6

Computer Science

Computer Science ................................................... 18

Minor Code: 6119

Required courses .................................................. 15

- CMSC 1613 Programming I
- CMSC 2123 Discrete Structures
- CMSC 2613 Programming II
- CMSC 2833 Computer Organization I
- CMSC 3613 Data Structures and Algorithms

Elective Computer Science (3/4000 level) ..................... 3

Engineering Physics

Engineering Physics .............................................. 18

Minor Code: 6259

Required courses .................................................. 14-15

- PHY 2014 Physics for Science and Engineering I and Lab
- PHY 2114 Physics for Science and Engineering II and Lab
- PHY 3103 Modern Physics
- ENGR 2033 Statics OR
  - ENGR 2303 Electrical Science AND
  - ENGR 2311 Electrical Science Lab

Elective Physics and Engineering ............................... 3-4

Any 3000 or 4000 level ENGR course.

Grief, Death, and Dying

Grief, Death, and Dying .......................................... 18-19

Minor Code: 6139

Required courses .................................................. 9

- FNRL 3483 Psychology of Grief
- FNRL 3623 Thanatology and Unresolved Grief
- FNRL 4183 Natural History of Bereavement

Elective courses ..................................................... 9-10

Selected from the following:

- FNRL 2313 Contemporary Funeral Service
- FNRL 3304 Restorative Art
- FNRL 3383 Funeral Service Statutory Law
- FNRL 3393 Mortuary Jurisprudence
- FNRL 3433 Introduction to Pathology
- FNRL 3493 Funeral Service Communication
- FNRL 3513 History of Funeral Directing

Mathematics

Mathematics ......................................................... 18

Minor Code: 6179

Required courses .................................................. 12

- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4

Elective Mathematics (3/4000 level) ............................ 6

(May include three hours from a 3000 or 4000 level statistics course.)

Science Education

Science Education - Secondary Science Education .......... 18

Minor Code: 6059

Required courses .................................................. 18

- PTE 4333 Meeting Secondary Students’ Needs
- PTE 4433 Designing Instruction for Secondary Students
- PTE 4543 Managing Secondary Classrooms
- PTE 4623 Secondary Class Assessment
- BIO 4812 Teaching and Learning in Science Classrooms
- BIO 4853 General Methods of Teaching Science and Lab
* BIO 4930 Individual Study in Biology (1 hour) OR
  PHY 4930 Individual Study in Physics (1 hour) OR
  CHEM 4930 Individual Study in Chemistry (1 hour)
* Students will take the Individual Study from the Science Education coordinator within their content area.

A grade of “C” or better is required in each course.

**Statistics**

**Statistics** .......................................................... 18

Minor Code: 6178

Any 18 hours of Statistics (6 hours at 3/4000 level)
Certificate

Funeral Service Certificate

UCO Code:  6121

I. General Courses ................................................................. 30

The following courses:
ACCT  2113  Accounting I
HLTH 1112  Healthy Life Skills
ENG  1113  English Composition
ENG  1213  English Composition and Research
MCOM 1113  Fundamentals of Speech
BIO  1114  General Biology OR
BIO  1214  General Biology and Lab
CHEM 1014  Introduction to Chemistry and Lab
PSY  1103  General Psychology
MATH 1513  College Algebra OR
higher level math
* FNRL  4522  Board Review

II. Basic Sciences ................................................................... 11

The following courses:
BIO  2314  Introduction to Microbiology and Lab
FNRL  2214  Intro Human Anatomy and Dissection
FNRL  3433  Introduction to Pathology

III. Mortuary Arts and Sciences ............................................. 20

The following courses:
FNRL  3054  Embalming Chemistry
FNRL  3204  Embalming
FNRL  3304  Restorative Art
* FNRL  4118  Practicum in Embalming and Funeral Directing

IV. Mortuary Administration ................................................... 27

The following courses:
FNRL  1211  Orientation to Funeral Service
FNRL  2313  Contemporary Funeral Service
FNRL  3374  Funeral Home Management I
FNRL  3383  Funeral Home 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.

Total hours required ............................................................. 88

The above course work meets licensing examination requirements in many states. Additional college hours of credit are required for Oklahoma funeral directing and embalming licensure. Students should check with their home state for specific requirements. A minimum grade point average of 2.00 must be earned in all work applicable to the program. A minimum grade of “C” must be earned in all Funeral Service major courses. Students must have completed a minimum of 30 semester hours credit in residence at the University of Central Oklahoma including 15 hours in residence at UCO of the final 30 hours applied toward the certificate program.

National Board Examination scores, graduation rates, and employment rates for this and other ABFSE-accredited programs are available at www.abfse.org. To request a printed copy of this program’s scores and rates, go to: UCO Department of Funeral Service, CHS 154, 100 North University Drive, Edmond, OK 73034 or by e-mail at funeralservice@uco.edu, or by telephone, (405) 974-5001.

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.

Admission to this program has special requirements. See page 54 of the 2014-2015 catalog for selective admission criteria.