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)

For a full list of courses see University Core.

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

Written and Oral Communication ................................................. 9

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

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

Prerequisite Courses

Required courses:
*MATH 1533 Precalculus-Algebra OR
MATH 1513 College Algebra OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 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

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

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

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

University Core (Total Listed 42-44)

For a full list of courses see University Core.

• 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 1453 Applied Algebra OR
MATH 1513 College Algebra AND
MATH 1593 Plane Trigonometry

Major Requirements

Biology ................................................................. 67

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

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

Physics ........................................................................... 4

Required course:
  PHY 1114 General Physics I and Lab

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.

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 Academic Degree Requirements.
University Core (Total Listed 42-44)

- 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

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 1453 Applied Algebra 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 4640 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
Program: Biology - continued
Major: Biology-Biomedical Sciences
Degree: Bachelor of Science (B.S.)

Minimum Required Hours

- CONTINUED FROM PREVIOUS PAGE -

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 4930</td>
<td>Individual Study in Biology</td>
</tr>
<tr>
<td>BIO 4950</td>
<td>Internship in Biology</td>
</tr>
<tr>
<td>BIO 4960</td>
<td>Institute in Biology</td>
</tr>
<tr>
<td>BIO 4970</td>
<td>Study Tour in Biology</td>
</tr>
</tbody>
</table>

*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, 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 Academic Degree Requirements.

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

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

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For a full list of courses see University Core.

• 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 ...............................................................0-3

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

Two years of high school algebra OR
MATH 1453 Applied Algebra OR
MATH 1513 College Algebra

Major Requirements

Biology-Medical Laboratory Sciences .................. 87

Students may earn the B.S. in Biology-Medical Laboratory Science from UCO upon completion of the following three year curriculum and an additional one year in a hospital school approved by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).

Biology and Chemistry .................................................. 47

Required Courses:

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

Mathematics ................................................................. 6

Required courses:

MATH 2153 BioCalculus
STAT 2103 Intro Statistics for Sciences

Elective Biology and/or Chemistry ......................... 4

Selected from the following courses:

BIO 3403 Comparative Animal Physiology OR
BIO 3464 Comparative Animal Physiology and Lab

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

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

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

<table>
<thead>
<tr>
<th>Support Courses</th>
<th>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written and Oral Communication</td>
<td>9</td>
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<td>10-11</td>
</tr>
<tr>
<td>Critical Inquiry and Aesthetic Analysis</td>
<td>6</td>
</tr>
</tbody>
</table>

**Support Courses**

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

**Math**

- MATH 1533 Precalculus-Algebra OR MATH 1513 College Algebra OR Placement Score AND MATH 1593 Plane Trigonometry OR Placement Score

*A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 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**  
**Required courses:**

- BIO 1204 Biology for Majors: Principles
- BIO 2203 Cell Biology
- BIO 2604 Human Physiology and Laboratory

**Chemistry**  
**Required courses:**

- CHEM 1103 General Chemistry I
- CHEM 1112 General Chemistry I Recitation/Laboratory

**Engineering**  
**Required courses:**

- ENGR 1112 Introduction to Engineering and Laboratory
- ENGR 1213 Engineering Computing and Laboratory
- BME 1311 Introduction to Biomedical Engineering
- ENGR 2033 Statics
- ENGR 2303 Electrical Science
- ENGR 2311 Electrical Science Laboratory

**#BME 3043 Biomaterials**

**Biomedical Engineering Elective**  
**Required courses:**

- BME 3113 Principles of Biomedical Engineering
- ENGR 3223 Digital Logic Design and Laboratory
- ENGR 3303 Engineering Probability and Statistics
- #ENGR 3323 Signals and Systems
- #ENGR 3331 Signals and Systems Laboratory
- ENGR 3403 Analog Electronics
- ENGR 3421 Analog Electronics Laboratory
- #BME 4132 Biomedical Engineering Laboratory
- #BME 4223 Biomedical Imaging
- #BME 4233 Biomedical Instrumentation
- #BME 4343 Biomechanics
- #BME 4882 BME Senior Engineering Design I
- #ENGR 4892 Senior Engineering Design II

**Mathematics**  
**Required courses:**

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

**Physics**  
**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**  
**Required courses:**

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

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 Academic Degree Requirements.

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 Core (Total Listed 42-44)

For a full list of courses see University Core.

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

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<thead>
<tr>
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<tbody>
<tr>
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<td>10-11</td>
</tr>
<tr>
<td>Critical Inquiry and Aesthetic Analysis</td>
<td>6</td>
</tr>
</tbody>
</table>

#### Support Courses

**Required Courses:**

- MATH 1533 Precalculus-Algebra OR MATH 1513 College Algebra OR Placement Score AND MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

#### Major Requirements

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

- 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

- CHEM 3503 Physical Chemistry I
- CHEM 3513 Physical Chemistry II
- CHEM 3602 Experimental Physical Chemistry
- CHEM 4502 Directed Research and Lab (taken twice)

**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

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

University of Central Oklahoma Undergraduate Catalog 2020-2021

Minimum Required Hours

For a full list of courses see University Core.

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

**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

Required Courses:

*MATH 1533 Precalculus-Algebra OR
  MATH 1513 College Algebra OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

*A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

**Major Requirements**

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

**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 I
MATH 2323 Calculus II
MATH 2333 Calculus III
PHY 2014 Physics for Science and Engineering I and Lab
PHY 2114 Physics for Science and Engineering II and Lab

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

Required courses: ............................................................................. 22

CHEM 3403 Biochemistry I
CHEM 3503 Physical Chemistry I
CHEM 3513 Physical Chemistry II
CHEM 3602 Experimental Physical Chemistry

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 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 Academic Degree Requirements.
Program: Chemistry  
Major: Chemistry - Health Sciences  
Degree: Bachelor of Science (B.S.)  
Dept: Chemistry  
College: Mathematics and Science  
Major Code: 6062

University Core (Total Listed 42-44)

For a full list of courses see University Core.

- 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 ................................................................. 0-6

Required Courses:
- MATH 1453 Applied Algebra OR
- MATH 1513 College Algebra OR Placement Score OR
- MATH 1533 Precalculus-Algebra OR Placement Score AND
- MATH 1593 Plane Trigonometry OR Placement Score

Major Requirements

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

Common Core ................................................................. 56

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

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

Required courses: .............................................................. 14
- BIO 3054 Microbiology for Majors and Lab
- CHEM 3203 Introductory Physical Chemistry
- CHEM 3403 Biochemistry I
- CHEM 3442 Experimental Biochemistry
- CHEM 4892 Capstone for Chemistry

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

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

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For a full list of courses see University Core.

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 Academic Degree Requirements.

Support Courses

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

Advanced Placement High School Programming Course OR
CMSC 1513 Beginning Programming

*MATH 1533 Precalculus-Algebra OR
MATH 1513 College Algebra OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

*A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 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 ................................................................. 61

^ CMSC 1613 Programming I
^ CMSC 1621 Programming I Laboratory
^ CMSC 2123 Discrete Structures
^ CMSC 2613 Programming II
^ CMSC 2621 Programming II Laboratory
^ CMSC 2833 Computer Organization I
^ SE 3103 Object Oriented Software Design and Construction
^ CMSC 3613 Data Structures and Algorithms
^ CMSC 3621 Data Structures/Algorithms Lab
^ 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

Elective Science Courses ........................................... 4-5

PHY 1114 General Physics I and Laboratory OR
PHY 2014 Physics for Science & Engineering I & Lab OR
CHEM 1103 General Chemistry I AND
CHEM 1112 General Chemistry I Recitation/Laboratory

Elective CMSC or SE courses ..................................... 15

Any 3/4000 level CMSC or SE courses
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

University Core (Total Listed 42-44)

Minimum Required Hours

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

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

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

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

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

Minimum Required Hours

^*CMSC 4513 Software Design and Development
^ MATH 2313 Calculus 1
^ 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 1

^ 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.

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

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

Placement Score .......................................................... 3

Quantitative Reasoning/Scientific Method .................................. 10-11

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

Written and Oral Communication ............................................. 9

OR

Required Hours

2.00

Critical Thinking ............................................................

• Critical Inquiry and Aesthetic Analysis
  • Life Science
  • Written and Oral Communication
  • Quantitative Reasoning/Scientific Method

Support Courses

University Core (Total Listed 42-44)

Minimum Required Hours

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

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

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

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

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

Minimum Required Hours

^*CMSC 4513 Software Design and Development
^ MATH 2313 Calculus 1
^ 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 1

^ 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 Science & Engineering I & Lab OR
CHEM 1103 General Chemistry I AND
CHEM 1112 General Chemistry I Recitation/Laboratory

Elective CMSC or SE courses ..................................... 15

Any 3/4000 level CMSC or SE courses
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

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 Academic Degree Requirements.
University Core (Total Listed 42-44)

For a full list of courses see University Core.

### Written and Oral Communication
- 9

### Quantitative Reasoning/Scientific Method
- Math: 3
- Life Science: 4
- Physical Science: 3-4

### Critical Inquiry and Aesthetic Analysis
- Aesthetic Analysis: 3
- Critical Inquiry: 3

Major Requirements

**Computer Science - Applied**

### Major Support Courses

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

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

  * CMSC 1533 Precalculus-Algebra OR
  * MATH 1513 College Algebra Placement Score AND
  * MATH 1593 Plane Trigonometry Placement Score

  * A grade of `C` or better is required for either MATH 1513 or MATH 1533 and MATH 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.)

### Minimum Required Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMSC 1613 Programming I</td>
<td>49</td>
</tr>
<tr>
<td>CMSC 1621 Programming I Laboratory</td>
<td></td>
</tr>
<tr>
<td>CMSC 2123 Discrete Structures</td>
<td></td>
</tr>
<tr>
<td>CMSC 2413 Visual Programming</td>
<td></td>
</tr>
<tr>
<td>CMSC 2613 Programming II</td>
<td></td>
</tr>
<tr>
<td>CMSC 2621 Programming II Laboratory</td>
<td></td>
</tr>
<tr>
<td>CMSC 2833 Computer Organization I</td>
<td></td>
</tr>
<tr>
<td>SE 3103 Object Oriented Software Design and Construction</td>
<td></td>
</tr>
<tr>
<td>CMSC 3303 Systems Analysis and Design OR</td>
<td></td>
</tr>
<tr>
<td>SE 4283 Software Engineering I</td>
<td></td>
</tr>
<tr>
<td>CMSC 3613 Data Structures and Algorithms</td>
<td></td>
</tr>
<tr>
<td>CMSC 3621 Data Structures/Algorithms Lab</td>
<td></td>
</tr>
<tr>
<td>CMSC 4003 Applications of Database Management Systems</td>
<td></td>
</tr>
<tr>
<td>CMSC 4023 Programming Languages OR</td>
<td></td>
</tr>
<tr>
<td>CMSC 4173 Translator Design</td>
<td></td>
</tr>
<tr>
<td>CMSC 4153 Operating Systems</td>
<td></td>
</tr>
<tr>
<td>CMSC 4401 Ethics in Computing</td>
<td></td>
</tr>
<tr>
<td><strong>CMSC 4513 Software Design and Development</strong></td>
<td></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
- Required Health Course ................................................................ 2
- Elective Life Skills .................................................................... 3

Support Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMSC 4003 Applications of Database Management Systems</td>
<td></td>
</tr>
<tr>
<td>CMSC 4153 Operating Systems</td>
<td></td>
</tr>
<tr>
<td>CMSC 4401 Ethics in Computing</td>
<td></td>
</tr>
</tbody>
</table>

**Degree: Bachelor of Science (B.S.)**

**Program:** Computer Science

**Major:** Computer Science - Applied

**Degree:** Bachelor of Science (B.S.)

**Dept:** Computer Science

**College:** Mathematics and Science

**Major Code:** 6101

- CONTINUED ON NEXT PAGE -
Minimum Required Hours

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

- CONTINUED FROM PREVIOUS PAGE -

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

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

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

For other regulations pertaining to graduation, see Academic Degree Requirements.
### University Core (Total Listed 42-44)

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

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

<table>
<thead>
<tr>
<th>Minimum Required Hours</th>
<th>Social and Language Analysis</th>
<th>Life Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minimum Required Hours</th>
<th>Other areas of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

**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 Precalculus-Algebra OR
* MATH 1513 College Algebra OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

*A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

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

### Major Requirements

**Computer Science - Information Science ..........79**

<table>
<thead>
<tr>
<th>Required</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td></td>
</tr>
</tbody>
</table>

- CMSC 1613 Programming I
- CMSC 1621 Programming I Laboratory
- CMSC 2123 Discrete Structures
- CMSC 2413 Visual Programming
- CMSC 2613 Programming II
- CMSC 2621 Programming II Laboratory
- 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 3413 Enterprise Programming
- CMSC 3613 Data Structures and Algorithms
- CMSC 3621 Data Structures/Algorithms Lab

- CONTINUED ON NEXT PAGE -
Minimum Required Hours

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

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 Academic Degree Requirements.

Electives to bring total to ............................................ 124
For a full list of courses see University Core.

- 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 the Data Science program are encouraged to complete the following courses in high school.

Advanced Placement High School Programming Course OR
CMSC 1513 Beginning Programming
*MATH 1533 Precalculus-Algebra OR
MATH 1513 College Algebra OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

*A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 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

Data Science .............................................................................................. 66

Required Courses ...................................................................................... 48

CMSC 1613 Programming I
CMSC 1621 Programming I Laboratory
CMSC 2613 Programming II
CMSC 2621 Programming II Laboratory
CMSC 2123 Discrete Structures
CMSC 3613 Data Structures and Algorithms
CMSC 3621 Data Structures/Algorithms Lab
CMSC 4003 Applications of Database Management Systems
MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 3143 Linear Algebra
STAT 2113 Statistical Methods
STAT 3213 Fundamentals of Data Science
STAT 4413 Data Visualization and Exploration
STAT 4213 Applied Regression Analysis
STAT 4513 Statistical Consulting OR
STAT 4950 Internship in Statistics (3 hours)

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

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

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

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

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

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

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO ...... 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 Academic Degree Requirements.
**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)

- **American Historical and Political Analysis**  
  - American National Government  
  - American History

- **Quantitative Reasoning/Scientific Method**  
  - Math  
  - Life Science  
  - Physical Science

- **Critical Inquiry and Aesthetic Analysis**  
  - Aesthetic Analysis  
  - Critical Inquiry

- **Written and Oral Communication**  
  - 9

- **Support Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
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<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>Precalculus-Algebra OR</td>
</tr>
<tr>
<td>MATH 1513</td>
<td>College Algebra 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 either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

  Students majoring in the Electrical Engineering 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

**Electrical Engineering**  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 1112</td>
<td>Introduction to Engineering and Laboratory</td>
</tr>
<tr>
<td>ENGR 1213</td>
<td>Engineering Computing and Laboratory</td>
</tr>
<tr>
<td>ENGR 2033</td>
<td>Statics</td>
</tr>
<tr>
<td>ENGR 2303</td>
<td>Electrical Science</td>
</tr>
<tr>
<td>ENGR 2311</td>
<td>Electrical Science Laboratory</td>
</tr>
<tr>
<td>#ENGR 3183</td>
<td>Electromagnetic Fields I</td>
</tr>
<tr>
<td>ENGR 3223</td>
<td>Digital Logic Design and Laboratory</td>
</tr>
<tr>
<td>ENGR 3303</td>
<td>Engineering Probability &amp; Statistics</td>
</tr>
<tr>
<td>#ENGR 3323</td>
<td>Signals and Systems</td>
</tr>
<tr>
<td>ENGR 3333</td>
<td>Electromagnetic Fields II</td>
</tr>
<tr>
<td>ENGR 4183</td>
<td>Electromagnetic Fields II</td>
</tr>
<tr>
<td>ENGR 4263</td>
<td>Engineering Optics</td>
</tr>
<tr>
<td>ENGR 4303</td>
<td>Control Systems</td>
</tr>
<tr>
<td>#ENGR 4323</td>
<td>Digital and Analog Communication</td>
</tr>
<tr>
<td>#ENGR 4333</td>
<td>Digital Signal Processing</td>
</tr>
<tr>
<td>#ENGR 4351</td>
<td>Digital Signal Processing Laboratory</td>
</tr>
<tr>
<td>#ENGR 4803</td>
<td>Mechatronics &amp; Laboratory</td>
</tr>
<tr>
<td>#ENGR 4872</td>
<td>EE Senior Engineering Design I</td>
</tr>
<tr>
<td>#ENGR 4892</td>
<td>Senior Engineering Design II</td>
</tr>
<tr>
<td>CHEM 1203</td>
<td>General Chemistry I OR</td>
</tr>
<tr>
<td>CHEM 1213</td>
<td>General Chemistry II</td>
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<tr>
<td>CHEM 1233</td>
<td>General Chemistry Laboratory</td>
</tr>
<tr>
<td>MATH 2311</td>
<td>Calculus I</td>
</tr>
<tr>
<td>MATH 2323</td>
<td>Calculus II</td>
</tr>
<tr>
<td>MATH 2333</td>
<td>Calculus III</td>
</tr>
<tr>
<td>MATH 2343</td>
<td>Calculus IV</td>
</tr>
<tr>
<td>MATH 3103</td>
<td>Differential Equations</td>
</tr>
</tbody>
</table>

**Guided Engineering Electives**  

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

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

- CONTINUED FROM PREVIOUS PAGE -

*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.

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 Academic Degree Requirements.

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 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, Engineering Physics-Physics, Mechanical Engineering)

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: 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)

**For a full list of courses see University Core.**

- 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**

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL</td>
<td>1123 Contemporary Moral Problems</td>
</tr>
<tr>
<td>ECON</td>
<td>1103 Introduction to Economics</td>
</tr>
<tr>
<td>FMKT</td>
<td>2323 Global Protocol and Diversity (or Foreign Language)</td>
</tr>
</tbody>
</table>

*MATH 1533 Precalculus-Algebra OR MATH 1513 College Algebra OR Placement Score AND MATH 1593 Plane Trigonometry OR Placement Score

A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 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 (3000-level or 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

**American Historical and Political Analysis** .......................... 6

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

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

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

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

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

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

**Mathematics** ........................................................................ 15

- Required courses:
  - MATH 2313 Calculus 1
  - MATH 2323 Calculus 2
  - MATH 2333 Calculus 3
  - MATH 2343 Calculus 4
  - MATH 3103 Differential Equations

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

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

*Students in the Accelerated BS/MS program in Engineering Physics must enroll in the graduate level versions of this course. Students may take a maximum of nine hours and 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 Academic Degree Requirements.

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)

For a full list of courses see University Core.

- 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  

Funeral Service ................................................................. 67

Required Course .................................................................... 2
* 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 ....................................................... 30
Required courses:
FNRL 1211 Orientation to Funeral Service
FNRL 2313 Contemporary Funeral Service
FNRL 2413 Funeral Home Administration
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.

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

For other regulations pertaining to graduation, see Academic Degree Requirements.

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) 992 Mantua Pike, Suite 108, Woodbury Heights, NJ 08097 (816)233-3747 www.abfse.org.

Student Learning Outcomes

Upon completion of the accredited Bachelor’s Degree and Certificate program, students will be able to:
- Explain the importance of funeral service professionals in developing relationships with the families and communities they serve.
- Identify standards of ethical conduct in funeral service practice.
- Interpret how federal, state, and local laws apply to funeral service in order to ensure compliance.
- Apply principles of public health and safety in the handling and preparation of human remains.
- Demonstrate technical skills in embalming and restorative art that are necessary for the preparation and handling of human remains.
- Demonstrate skills required for conducting arrangement conferences, visitations, services, and ceremonies.
- Describe the requirements and procedures for burial, cremation, and other accepted forms of final disposition of human remains.
- Describe methods to address the grief-related needs of the bereaved.
- Explain management skills associated with operating a funeral establishment.
- Demonstrate verbal and written communication skills and research skills needed for funeral service practice.
Program: Mathematics
Major: Mathematics
Degree: Bachelor of Science (B.S.)

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

University Core (Total Listed 42-44)

For a full list of courses see University Core.
• 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

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

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

For other regulations pertaining to graduation, see Academic Degree Requirements.

Prerequisite Courses

Prerequisite Courses ................................................................. 0-6
*MATH 1533 Precalculus-Algebra OR
  MATH 1513 College Algebra OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score
*A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

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

Major Requirements

Mathematics ................................................................. 47
Required................................................................. 30
  MATH 2313 Calculus 1
  MATH 2323 Calculus 2
  MATH 2333 Calculus 3
  MATH 2343 Calculus 4
  MATH 2753 Technology for Professional Math and Statistics
  MATH 3113 Foundations of Advanced Math
  MATH 3143 Linear Algebra
  MATH 3183 Introduction to Modern Algebra
  MATH 4143 Introduction to Analysis 1
  STAT 4113 Mathematical Statistics 1
Electives .................................................................................. 17
At least nine (9) hours must be selected from the following:
  MATH 3103 Differential Equations
  MATH 3163 Elementary Number Theory
  MATH 4153 Introduction to Analysis 2
  MATH 4483 History of Mathematics
  STAT 4123 Mathematical Statistics 2
  All other elective courses must be selected from 3000 and 4000 level MATH courses (including those MATH courses listed above).

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

For a full list of courses see University Core.

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

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

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

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

**Prerequisite Courses**

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

* A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

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

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

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 Academic Degree Requirements.
For a full list of courses see University Core.

- 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

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

Mathematics ...................................................... 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 OR
  - MATH 4143 Introduction to Analysis 1

Statistics ...................................................... 27

Required Courses .................................................. 18
  - 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 4513 Statistical Consulting

Electives .................................................. 9
  - Selected from the following:
    - STAT 3213 Fundamentals of Data Science
    - STAT 4253 Computer Applications in Statistics

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

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

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

<table>
<thead>
<tr>
<th>Course Category</th>
<th>Required Courses</th>
<th>Minimum Required Hours</th>
</tr>
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<tbody>
<tr>
<td>• Written and Oral Communication</td>
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<td>9</td>
</tr>
<tr>
<td>Quantitative Reasoning/Scientific Method</td>
<td></td>
<td>10-11</td>
</tr>
<tr>
<td>• Math</td>
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</tr>
<tr>
<td>Life Science</td>
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<tr>
<td>Physical Science</td>
<td></td>
<td>3-4</td>
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<td></td>
<td>3</td>
</tr>
<tr>
<td>Critical Inquiry</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

### 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 Precalculus-Algebra OR MATH 1513 College Algebra OR Placement Score AND MATH 1593 Plane Trigonometry OR Placement Score

*A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

### 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 3163 Elementary Number Theory
- MATH 3183 Introduction to Modern Algebra
- 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
- PTE 3153 Adolescent Psychology
- SPED 4123 Teaching Individuals with Disabilities
- MATH 3323 Teaching Middle School Math
- ^MATH 4843 Teaching Secondary Mathematics
- ^PTE 4172 Educational Assessment
- ^PTE 4533 Contemporary Learning Sciences
- ^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

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

It is strongly recommended PHY 1114 General Physics I and Lab be taken in the general education core. Students planning to do graduate work should take MATH 3183, Introduction to Modern Algebra and MATH 4143, Introduction to Analysis 1.

### 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 [Academic Degree Requirements](#).
Program: Mechanical Engineering
Major: Mechanical Engineering
Degree: Bachelor of Science (B.S.)

<table>
<thead>
<tr>
<th>Major Code: 6270</th>
</tr>
</thead>
</table>

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

For a full list of courses see [University Core](#).

- 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 Precalculus-Algebra OR
*MATH 1513 College Algebra OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

*A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

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

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

**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

**Mechanical Engineering** .................................................... 94-99

**Physics** ................................................................................ 11

| 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

| 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 |

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

| 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 |

**Guided Physics or Engineering Electives** .............................. 6

Selected from the following:

- ENGR 3153 Machine Dynamics
- ENGR 3223 Digital Logic Design and Laboratory
- ENGR 3803 Electrical Power Systems
- ENGR 4103 Finite Element Analysis
- ENGR 4153 Vibration
- ENGR 4203 Refrigeration and Air Conditioning

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

- CONTINUED FROM PREVIOUS PAGE -

ENGR 4303 Control Systems
ENGR 4313 Fluid Dynamics
BME 4343 Biomechanics
PHY 4163 Analytical Mechanics

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

# Admission into Engineering and Physics Upper Division is required.

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 Academic Degree Requirements.

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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 2313</td>
<td>Calculus 1</td>
</tr>
<tr>
<td>MATH 2323</td>
<td>Calculus 2</td>
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<td>Calculus 3</td>
</tr>
<tr>
<td>MATH 2343</td>
<td>Calculus 4</td>
</tr>
<tr>
<td>MATH 3103</td>
<td>Differential Equations (Recommended)</td>
</tr>
<tr>
<td>PHY 2014</td>
<td>Physics for Science &amp; Engineering I &amp; Lab</td>
</tr>
<tr>
<td>PHY 2114</td>
<td>Physics for Science &amp; Engineering II &amp; Lab</td>
</tr>
<tr>
<td>ENGR 1112</td>
<td>Introduction to Engineering &amp; Lab</td>
</tr>
<tr>
<td>ENGR 1213</td>
<td>Engineering Computing &amp; Lab</td>
</tr>
<tr>
<td>ENGR 2033</td>
<td>Statics</td>
</tr>
</tbody>
</table>

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

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, Engineering Physics-Physics, Mechanical Engineering)

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

University Core (Total Listed 42-44)

For a full list of courses see University Core.
• 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

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 Academic Degree Requirements.

- CONTINUED ON NEXT 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. Human Anatomy must be successfully completed before starting NURS 2207 Foundations of Nursing. Students may enroll a maximum of two times in any nursing course.

C. Score on the Health Education Systems, Inc. Admission Assessment HESI A2 Exam.

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).

Fast Track - BS

A fast track BS is offered to qualified applicants with a prior Baccalaureate degree in any field. Applicant must meet traditional program requirements and must have completed all science requirements before starting the track. Crossovers between tracks for nursing are not permitted. A separate application is required for each track.

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

University Core (Total Listed 42-44)

For a full list of courses see University Core.

- 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 ............................................................. 3-4
  - Life Science .................................................. 3-4
  - Physical Science ............................................. 3-4
- Critical Inquiry and Aesthetic Analysis ....................................... 6
  - Aesthetic Analysis ............................................. 3
  - Critical Inquiry ............................................... 3

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

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

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

- Two years of high school Algebra and one year of Trigonometry OR
  - MATH 1453 Applied Algebra OR
  - MATH 1513 College Algebra AND
  - MATH 1593 Plane Trigonometry

Major Requirements

Science Education - Biology .................................................. 65

- 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

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

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 ...................................................... 128*

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

^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 Contemporary Learning Sciences
^PTE 4811 Contemporary Issues
^PTE 4838 Internship/Student Teaching Secondary
^PTE 4853 Classroom Management & Instruction

*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.
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, Pro-
   fessional Education, and area of specialization (major)....... “C”
4. Proficiency in foreign language ................................. Novice 4 level

For other regulations pertaining to graduation, see
Academic Degree Requirements.
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)

Minimum Required Hours
3

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

Science Education - Chemistry .................................. 28

Required Courses .................................................. 18
CHEM 2104 Quantitative Analysis and Lab
CHEM 3303 Organic Chemistry I
CHEM 3312 Organic Chemistry I Lab
CHEM 3323 Organic Chemistry II
CHEM 3203 Introduction to Physical Chemistry
CHEM 3403 Biochemistry I

Elective Courses .................................................. 10
Any 3/4000 level Biology, Chemistry, Physics or Math courses

Professional Education ......................................... 31
PTE 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 Contemporary Learning Sciences
#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.)  
Dept: Chemistry  
College: Mathematics and Science  
Major Code: 6041  

- 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 Academic Degree Requirements.
Program: Science Education  
Major: Science Education - General Science  
Degree: Bachelor of Science in Education (B.S.Ed.)  
Dept: Biology  
College: Mathematics and Science  
Major Code: 6042

University Core (Total Listed 42-44)

For a full list of courses see University Core.

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

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

Quantitative Reasoning/Scientific Method .................................................. 10-11

• Math .......................... 3

• Life Science ...................... 4

• Physical Science .................. 3-4

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

Aesthetic Analysis ...................................................... 3

Critical Inquiry ...................................................... 3

Support Courses

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

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

Students majoring in the 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 1453 Applied Algebra 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

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

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

Required course:
PHY 3014 Earth Science

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

Required courses:
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
CHEM 2104 Quantitative Analysis and 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 Laboratory
PHY 1304 Descriptive Astronomy

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 Contemporary Learning Sciences
^#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 Academic Degree Requirements.
For a full list of courses see University Core.

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

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

Quantitative Reasoning/Scientific Method .................................................. 10-11

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

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

Aesthetic Analysis ......................................................................................... 3

Critical Inquiry .............................................................................................. 3

Support Courses

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

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

Students majoring in the 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 1453 Applied Algebra OR
MATH 1513 College Algebra AND
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 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

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

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

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

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

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

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

Required course:
STAT 2103 Introduction to Statistics for Sciences

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

Required course:
CMSC 1513 Beginning Programming

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

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

Elective Science ............................................................................................. 8

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

* Students choosing to take PHY 1114 and PHY 1214 Gen Physics I & II can only take CHEM courses within the Elective Science due to prerequisites. To take Engineering courses, students must take PHY 2014 Physics for 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.

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

PTE 1010 Introduction to Teacher Education
PTE 3023 Foundations of American Education/Clinical Exp
PTE 3153 Adolescent Psychology

- CONTINUED ON NEXT PAGE -
Program: Science Education - continued
Major: Science Education - Physical Science
Degree: Bachelor of Science in Education (B.S.Ed.)
Dept: Engineering and Physics
College: Mathematics and Science
Major Code: 6043

Minimum Required Hours

- CONTINUED FROM PREVIOUS PAGE -

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 Contemporary Learning Sciences
^#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 Academic Degree Requirements.
### Program:
Science Education

**Major:** Science Education - Physics

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

**Dept:** Engineering and Physics

**College:** Mathematics and Science

**Major Code:** 6044

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

- **American Historical and Political Analysis**
  - University Core

- **American National Government**
  - Minimum 3 credit hours

- **American History**
  - Minimum 3 credit hours

- **Cultural and Language Analysis**
  - Minimum 3-4 credit hours

- **Second Language**
  - Minimum 4 credit hours

- **OR Cultural Analysis**
  - Minimum 3 credit hours

#### Social and Behavioral Analysis
- Minimum 3 credit hours

- **Life Skills**
  - Minimum 5 credit hours

- **Required Health Course**
  - Minimum 2 credit hours

- **Elective Life Skills**
  - Minimum 3 credit hours

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#### Support Courses

**Support Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCOM</td>
<td>Fundamentals of Speech</td>
</tr>
<tr>
<td>ENG</td>
<td>English Composition</td>
</tr>
<tr>
<td>ENG</td>
<td>English Composition and Research</td>
</tr>
<tr>
<td>MATH</td>
<td>Precalculus-Algebra OR</td>
</tr>
<tr>
<td>MATH</td>
<td>College Algebra OR Placement Score</td>
</tr>
<tr>
<td>MATH</td>
<td>Plane Trigonometry OR Placement Score</td>
</tr>
</tbody>
</table>

*A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 1593 to take MATH 2313.

#### Major Requirements

**Science Education - Physics**

<table>
<thead>
<tr>
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<th>Course Name</th>
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<tr>
<td>MATH</td>
<td>Calculus 1</td>
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<td>MATH</td>
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<td>MATH</td>
<td>Calculus 3</td>
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<td>Calculus 4</td>
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<td>MATH</td>
<td>Differential Equations</td>
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<td>ENGR</td>
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<td>Engineering Probability and Statistics</td>
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<tr>
<td>ENGR</td>
<td>Electrical Science</td>
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<tr>
<td>ENGR</td>
<td>Electrical Science Lab</td>
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</table>

**Professional Education**

<table>
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<th>Code</th>
<th>Course Name</th>
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</thead>
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<tr>
<td>PTE</td>
<td>Introduction to Teacher Education</td>
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<tr>
<td>PTE</td>
<td>Foundations of American Education/Clinical Exp</td>
</tr>
<tr>
<td>PTE</td>
<td>Adolescent Psychology</td>
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<tr>
<td>SPED</td>
<td>Teaching Individuals with Disabilities</td>
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<tr>
<td>^BIO</td>
<td>Teaching and Learning in Science Classrooms</td>
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<td>Contemporary Learning Sciences</td>
</tr>
<tr>
<td>^PTE</td>
<td>Internship/Student Teaching Secondary</td>
</tr>
<tr>
<td>^PTE</td>
<td>Classroom Management &amp; Instruction</td>
</tr>
</tbody>
</table>

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

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**Minimum Hours required**

- Total hours required: 125
- Credit hour institutional requirement 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
Academic Degree Requirements.
Program: Software Engineering  Major: Software Engineering  Degree: Bachelor of Science (B.S.)

Dept: Computer Science  College: Mathematics and Science  Major Code: 6110

For a full list of courses see 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 courses in high school.

Advanced Placement High School Programming Course OR
CMSC 1513 Beginning Programming

*MATH 1533 Precalculus-Algebra OR
MATH 1513 College Algebra OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

* A grade of ‘C’ or better is required for either MATH 1513 or MATH 1533 and MATH 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 ........................................... 78-81

Required ......................................................... 55

CMSC 1613 Programming I
CMSC 1621 Programming I Laboratory
CMSC 2123 Discrete Structures
CMSC 2613 Programming II
CMSC 2621 Programming II Laboratory
CMSC 2833 Computer Organization I
SE 3103 Object Oriented Software Design and Construction
CMSC 3613 Data Structures and Algorithms
CMSC 3621 Data Structures/Algorithms Lab
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 I
MATH 2323 Calculus 2

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

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

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

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

Minimum Required Hours

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.

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

Elective Science/Math courses ....................................... 8-11

Select a minimum of eight (8) hours including at least one of the CHEM or PHY lab courses:

CHEM 1103 General Chemistry I
CHEM 1112 General Chemistry I Recitation/Laboratory
CHEM 1223 General Chemistry II
CHEM 1232 General Chemistry II Recitation/Laboratory
PHY 1114 General Physics I and Laboratory
PHY 1214 General Physics II and Laboratory
PHY 2014 Physics for 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 -
Elective CMSC or SE Courses ......................................................... 6
   Any 3/4000 level CMSC or SE courses except CMSC 4513

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

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

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

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

For other regulations pertaining to graduation, see Academic Degree Requirements.
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 ............................................................ 21
Minor Code: 6119

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

- CMSC 1613 Programming I
- CMSC 1621 Programming I Laboratory
- CMSC 2123 Discrete Structures
- CMSC 2613 Programming II
- CMSC 2621 Programming II Laboratory
- CMSC 2833 Computer Organization I
- CMSC 3613 Data Structures and Algorithms
- CMSC 3621 Data Structures/Algorithms Lab

Elective CMSC or SE Courses (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 2213 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 ................................................................. 27

The following courses:
- 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 1453 Applied 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 .................................................... 30

The following courses:
- FNRL 1211 Orientation to Funeral Service
- FNRL 2313 Contemporary Funeral Service
- FNRL 2413 Funeral Home Administration
- 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 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) 992 Mantua Pike, Suite 108, Woodbury Heights, NJ 08097 (816) 233-3747 www.abfse.org

Student Learning Outcomes

Upon completion of the accredited Bachelor’s Degree and Certificate program, students will be able to:
- Explain the importance of funeral service professionals in developing relationships with the families and communities they serve.
- Identify standards of ethical conduct in funeral service practice.
- Interpret how federal, state, and local laws apply to funeral service in order to ensure compliance.
- Apply principles of public health and safety in the handling and preparation of human remains.
- Demonstrate technical skills in embalming and restorative art that are necessary for the preparation and handling of human remains.
- Demonstrate skills required for conducting arrangement conferences, visitations, services, and ceremonies.
- Describe the requirements and procedures for burial, cremation, and other accepted forms of final disposition of human remains.
- Describe methods to address the grief-related needs of the bereaved.
- Explain management skills associated with operating a funeral establishment.
- Demonstrate verbal and written communication skills and research skills needed for funeral service practice.