College of Mathematics and Science

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication ................................................. 9
Quantitative Reasoning/Scientific Method ................................... 10-11

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

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

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

Prerequisite Courses

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

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

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

Major Requirements

Actuarial Science ................................................................. 66

Mathematics Core ............................................................... 18

Required courses:
MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 2343 Calculus 4
MATH 2753 Technology for Professional Math and Statistics
MATH 3143 Linear Algebra

Actuarial Core ................................................................. 12

Required courses:
# MATH 3133 Theory of Interest 1
# MATH 4133 Theory of Interest 2
# MATH 4223 Mathematics of Life Contingencies 1
# MATH 4233 Mathematics of Life Contingencies 2

Statistics Core ................................................................. 15

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

Finance and Insurance Electives ........................................... 15

Select from the following:
* ECON 2103 Principles of Microeconomics
* ECON 2203 Principles of Macroeconomics
FIN 3523 Foundations of Insurance and Risk Management
FIN 3553 Property and Liability Insurance for the Firm

Minimum Grade Requirements

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: **Biology**
Major: **Biology**
Degree: Bachelor of Science (B.S.)

<table>
<thead>
<tr>
<th>Dept:</th>
<th>Biology</th>
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<tbody>
<tr>
<td>College:</td>
<td>Mathematics and Science</td>
</tr>
<tr>
<td>Major Code:</td>
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</tr>
</tbody>
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### University Core (Total Listed 42-44)

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

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

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

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

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

**Support Courses**

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

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

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

**Major Requirements**

**Biology** ................................................................. 67

**Biology Core (required of all degree candidates)** .................. 26

**Required Courses:**
- BIO 1204 Biology I for Majors
- BIO 1225 Biology II for Majors and Lab
- BIO 2203 Cell Biology
- BIO 2211 Cell Biology Laboratory
- BIO 3054 Microbiology for Majors and Lab
- BIO 3303 Genetics
- BIO 3543 General Ecology
- BIO 3703 Evolution
- *BIO 4840 Capstone*

**Mathematics** ................................................................. 6

**Required courses:**
- MATH 2153 BioCalculus
- STAT 2103 Intro Statistics for Sciences

**Chemistry** ................................................................. 15

**Required courses:**
- CHEM 1103 General Chemistry I
- CHEM 1112 General Chemistry I - Recitation/Lab
- CHEM 1223 General Chemistry II
- CHEM 1232 General Chemistry II - Recitation/Lab
- CHEM 3303 Organic Chemistry I OR
  - CHEM 3013 Organic Chemistry for Life Sciences
- CHEM 3312 Organic Chemistry I Lab OR
- CHEM 3022 Organic Chemistry for Life Sciences Lab

**Physics** ................................................................. 4

**Required course:**
- PHY 1114 General Physics I and Lab

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

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

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

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

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

**Upper Division Biology Electives** *(to bring major total to 67)**... 16

**Any 3000/4000 level UCO BIO course or its equivalent AND/OR**
- CHEM 3403 Biochemistry I

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

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

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

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

- CONTINUED ON NEXT PAGE -
Electives to bring total to ........................................ 124

General Physics II is a recommended elective.

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

**Minimum Grade Requirements**

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Biology
Major: Biology-Biomedical Sciences
Degree: Bachelor of Science (B.S.)

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication .......................................................... 9
Quantitative Reasoning/Scientific Method ........................................... 10-11
• Math ............................................................ 3
• Life Science .................................................. 4
• Physical Science ............................................ 3-4

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

Support Courses

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

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

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

Major Requirements

Biology-Biomedical Sciences ..............................................73

Biology Core ........................................................................... 20

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

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

Required courses:
MATH 2153 BioCalculus
STAT 2103 Intro Statistics for Sciences

Chemistry .............................................................................. 15

Required courses:
CHEM 1103 General Chemistry I
CHEM 1112 General Chemistry I - Recitation/Lab
CHEM 1223 General Chemistry II
CHEM 1232 General Chemistry II - Recitation/Lab
CHEM 3303 Organic Chemistry I OR
CHEM 3013 Organic Chemistry for Life Sciences
CHEM 3312 Organic Chemistry I Lab OR
CHEM 3022 Organic Chemistry for Life Sciences Lab

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

Required course:
PHY 1114 General Physics I and Lab

*Guided Electives .................................................................28

Selected from the following:

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

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

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

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

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

Minimum Required Hours

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

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

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

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

- CONTINUED FROM PREVIOUS PAGE -

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

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

*Total hours required for this major may exceed the minimum 124 credit hour institutional requirement and will vary according to course selection. It is recommended students complete high school algebra II, trigonometry, physics, and two years of a second language in high school. Graduating seniors must take a national assessment exam in Biology as a graduation requirement for the B.S. in Biology-Biomedical Sciences.

Minimum Grade Requirements

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.

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

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

University of Central Oklahoma Undergraduate Catalog 2017-2018

Minimum Required Hours
Minimum
Required Hours
University Core  (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.  
- Courses from the major may apply to the areas marked in the 
  University Core.

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

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

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

Support Courses

Support Courses.................................................................0-3

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

Two years of high school algebra OR
MATH  1513  College Algebra

Major Requirements

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

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

Biology and Chemistry ......................................................... 47
Required Courses:
  BIO  1204  Biology I for Majors
  BIO  1225  Biology II for Majors and Lab
  BIO  2203  Cell Biology
  BIO  2211  Cell Biology Laboratory
  BIO  2604  Human Physiology and Lab
  BIO  3054  Microbiology for Majors and Lab
  BIO  3303  Genetics
  BIO  4515  Pathogenic Microbiology and Immunology and Lab
  CHEM  1103  General Chemistry I
  CHEM  1112  General Chemistry I-Recitation/Lab
  CHEM  1223  General Chemistry II
  CHEM  1232  General Chemistry II-Recitation/Lab
  CHEM  3303  Organic Chemistry I
  CHEM  3312  Organic Chemistry I Lab
  CHEM  3403  Biochemistry I

Mathematics ................................................................. 6
Required courses:
  MATH  2153  BioCalculus
  STAT  2103  Intro Statistics for Sciences

Elective Biology and/or Chemistry ........................................... 4
Selected from the following courses:
  BIO  3403  Comparative Animal Physiology OR
  BIO  3464  Comparative Animal Physiology and Lab
  BIO  3414  Histology and Lab

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

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

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

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

Minimum Required Hours
Minimum
Required Hours

BIO  3803  Mammalian Physiology I
BIO  3813  Mammalian Physiology II
BIO  4414  Virology and Lab
BIO  4774  Parasitology and Lab
CHEM  3203  Introductory Physical Chemistry
CHEM  3323  Organic Chemistry II
CHEM  3332  Organic Chemistry II Lab
CHEM  3442  Experimental Biochemistry
CHEM  4103  Biochemistry II

#Medical Technology ................................................................ 30

Students must complete an appropriate one year program with an ap-
proved affiliate Hospital Medical Laboratory Science Program and 
satisfactorily complete the following courses through UCO.

BIO  4117  Clinical Microbiology
BIO  4236  Clinical Hematology
BIO  4246  Clinical Immunology
CHEM  4125  Clinical Chemistry I
CHEM  4325  Clinical Chemistry II
CHEM  4351  Topics in Medical Technology

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

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

Minimum Grade Requirements

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

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

For other regulations pertaining to graduation, see 
pages 67-68 of the 2017-2018 catalog.
Program: Biomedical Engineering
Major: Biomedical Engineering
Degree: Bachelor of Science (B.S.)

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
• Courses from the major may apply to the areas marked in the University Core.

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

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

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

Support Courses

Support Courses ................................................................. 9-18
PHIL 1123 Contemporary Moral Problems
ECON 1103 Introduction to Economics
FMKT 2323 Global Protocol and Diversity
(or Foreign Language)
*MATH 1533 Algebra for STEM OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

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

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

One year High School Physics OR
PHY 1003 Introduction to Physics

Major Requirements

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

Biology ................................................................. 11
Required courses:
BIO 1204 Biology I for Majors
BIO 2203 Cell Biology
BIO 2604 Human Physiology and Laboratory

Chemistry ................................................................. 5
Required courses:
CHEM 1103 General Chemistry I
CHEM 1112 General Chemistry I Recitation/Laboratory

Engineering ............................................................. 48
Required courses:
ENGR 1112 Introduction to Engineering and Laboratory
ENGR 1213 Engineering Computing and Laboratory
BME 1311 Introduction to Biomedical Engineering
ENGR 2033 Statics
ENGR 2303 Electrical Science
ENGR 2311 Electrical Science Laboratory
#BME 3043 Biomaterials
BME 3113 Principles of Biomedical Engineering

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

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

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

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

Mathematics ................................................................. 15
Required courses:
MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 2343 Calculus 4
MATH 3103 Differential Equations

Physics ................................................................. 8
Required courses:
PHY 2014 Physics for Science and Engineering I and Laboratory
^ PHY 2114 Physics for Science and Engineering II and Laboratory
^ A grade of “C” or better must be earned in PHY 2114.

Biomedical Engineering Elective ............................................. 3-6
Any 3000/4000 level BME, PHY or ENGR course with the following exceptions: PHY 3014, 3044, 3054 or 3503.

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

- CONTINUED ON NEXT PAGE -
Complete all the courses from one of the following concentrations:

Concentration A: (courses in preparation for Pre-Med fields)

- CHEM 1223 General Chemistry II
- CHEM 1232 General Chemistry II Recitation/Laboratory
- CHEM 3303 Organic Chemistry I

Concentration B: (courses in preparation for Instrumentation fields)

- PHY 3883 Mathematical Physics I

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

The following courses are strongly recommended electives:

- BME 4243 Modeling and Analysis of Biomedical Systems
- #ENGR 3443 Fluid Mechanics
- CHEM 3403 Biochemistry I
- CHEM 3323 Organic Chemistry II (for Concentration A)
- #ENGR 3183 Electromagnetic Fields I (for Concentration B)

# Admission into Engineering and Physics Upper Division is required.

Minimum Grade Requirements

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.

Admission into Engineering and Physics Upper Division

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

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

- A minimum retention grade point average (GPA) of 2.00 in all course work completed by the time the student is formally admitted into upper division.
- Completed 60 semester credit hours by the time the student is formally admitted into upper division.

- Completed the following courses or their equivalent with a minimum grade of “C” by the time the student is formally admitted into upper division:
  - MATH 2313 Calculus 1
  - MATH 2323 Calculus 2
  - MATH 2333 Calculus 3
  - MATH 2343 Calculus 4
  - MATH 3103 Differential Equations (Recommended)
  - PHY 2014 Physics for Science & Engineering I & Lab
  - PHY 2114 Physics for Science & Engineering II & Lab
  - ENGR 1112 Introduction to Engineering & Lab
  - ENGR 1213 Engineering Computing & Lab
  - ENGR 2033 Statics
  - ENGR 2303 Electrical Science
  - ENGR 2311 Electrical Science Lab
  - ENGR 3303 Engineering Probability and Statistics (Recommended)
  - CHEM 1112 General Chemistry I Recitation/Lab AND (for Biomedical Engineering)
  - CHEM 1103 General Chemistry I OR (for Biomedical Engineering)
  - CHEM 1315 Chemistry for Engineering and Lab (for Engineering Physics-Electrical Engineering, Mechanical Engineering, and Physics)

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

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

Specific courses within the University Core are listed on pages 96-97.
- Courses from the major may apply to the areas marked in the University Core.

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

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

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

**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**

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

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

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

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

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

**Major Requirements**

**Chemistry** ............................................................... 68

**Common Core** ................................................................. 45

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

**Advanced Chemistry** ............................................................ 23

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

Chemistry Electives ................................................................. 9

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

**Minimum Grade Requirements**

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Chemistry  
Major: Chemistry - ACS Certificate  
Degree: Bachelor of Science (B.S.)

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
- Courses from the major may apply to the areas marked in the University Core.

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

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

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

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**Support Courses**

Minimum Required Hours

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

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

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

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**Major Requirements**

Chemistry - ACS Certificate ..................................................74

Common Core ........................................................................... 45

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

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

Required courses: ................................................................. 24
- CHEM 3403 Biochemistry I
- CHEM 3503 Physical Chemistry I
- CHEM 3513 Physical Chemistry II
- CHEM 3602 Experimental Physical Chemistry
- CHEM 4454 Advanced Instrumental Analysis and Lab
- CHEM 4502 Directed Research and Lab
- CHEM 4603 Advanced Organic Chemistry
- CHEM 4654 Inorganic Chemistry and Lab

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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

The following are highly recommended:
- ENG 4023 Technical Writing
- MATH 2343 Calculus 4
- PHY 3103 Modern Physics

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Minimum Grade Requirements

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Chemistry  
Major: Chemistry - Health Sciences 
Degree: Bachelor of Science (B.S.) 

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

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication .................................................... 9
Quantitative Reasoning/Scientific Method .................................... 10-11
• Math .......................................................... 3
• Life Science .................................................. 4
• Physical Science ............................................ 3-4
Critical Inquiry and Aesthetic Analysis ........................................... 6
Aesthetic Analysis .............................................................. 3
Critical Inquiry .............................................................. 3

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

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

Social and Behavioral Analysis .................................................. 3
Life Skills ................................................................. 5
Required Health Course ....................................................... 2
Elective Life Skills ........................................................... 3

Support Courses

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

Required Courses:
MATH 1513 College Algebra OR
MATH 1533 Algebra for STEM 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 I for Majors
BIO 1225 Biology II for Majors and Lab
BIO 2203 Cell Biology
MATH 2153 Bio-Calculus
PHY 1114 General Physics I and Lab
PHY 1214 General Physics II and Lab
STAT 2103 Intro Statistics for Sciences

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

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

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

Minimum Grade Requirements

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Computer Science  
Major: Computer Science  
Degree: Bachelor of Science (B.S.)

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

University Core  (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.  
* Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication .............................................................. 9
Quantitative Reasoning/Scientific Method .............................................. 10-11
  * Math ................................................................. 3
  Life Science ............................................................... 4
  * Physical Science ......................................................... 3-4
Critical Inquiry and Aesthetic Analysis .................................................. 6
  Aesthetic Analysis .................................................................. 3
  Critical Inquiry ..................................................................... 3

Support Courses

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

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

Advanced Placement High School Programming Course OR
CMSC 1513 Beginning Programming

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

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

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

Major Requirements

Computer Science ................................................................. 80-82

Required ................................................................. 56
  ^ CMSC 1613 Programming I
  ^ CMSC 1621 Programming I Laboratory
  ^ CMSC 2123 Discrete Structures
  ^ CMSC 2613 Programming II
  ^ CMSC 2833 Computer Organization I
  ^ SE 3103 Object Oriented Software Design and Construction
  ^ CMSC 3613 Data Structures and Algorithms
  ^ CMSC 3833 Computer Organization II
  ^ CMSC 4003 Applications of Database Management Systems
  ^ CMSC 4023 Programming Languages OR
  ^ CMSC 4173 Translator Design
  ^ CMSC 4153 Operating Systems
  ^ CMSC 4273 Theory of Computing
  ^ SE 4283 Software Engineering I
  ^ CMSC 4401 Ethics in Computing
  ^ CMSC 4513 Software Design and Development
  ^ MATH 2313 Calculus 1
  ^ 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

<table>
<thead>
<tr>
<th>University Core  (Total Listed 42-44)</th>
<th>Minimum Required Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>^ MATH 2333 Calculus 3</td>
<td></td>
</tr>
<tr>
<td>^ MATH 3143 Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>^ STAT 2113 Statistical Methods OR</td>
<td></td>
</tr>
<tr>
<td>^ STAT 2103 Introduction to Statistics for Sciences OR</td>
<td></td>
</tr>
<tr>
<td>^ STAT 4113 Mathematical Statistics I</td>
<td></td>
</tr>
</tbody>
</table>

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

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

E elective Science/Math Courses ................................................... 8-10

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

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

Any non-required 2/3/4000 level MATH or STAT course with the following exceptions: MATH 2013, 2053, 2113, 2123, 2133, 2153, 2743, 3323, or 4843.

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

Select from the following:

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

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

Minimum Required Hours

- CONTINUED FROM PREVIOUS PAGE -

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

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

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

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Computer Science  
Major: Computer Science - Applied  
Degree: Bachelor of Science (B.S.)  
Dept: Computer Science  
College: Mathematics and Science  
Major Code: 6101

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

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

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

<table>
<thead>
<tr>
<th>Written and Oral Communication</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative Reasoning/Scientific Method</td>
<td>10-11</td>
</tr>
<tr>
<td>Critical Inquiry and Aesthetic Analysis</td>
<td>6</td>
</tr>
</tbody>
</table>

#### Support Courses

**Major Support Courses**  
0-9

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

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

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

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

**Computer Science** - Applied  
58

**Required**  
46

<table>
<thead>
<tr>
<th>CMSC 1613 Programming I</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMSC 1621 Programming I Laboratory</td>
</tr>
<tr>
<td>CMSC 2413 Visual Programming</td>
</tr>
<tr>
<td>CMSC 2123 Discrete Structures</td>
</tr>
<tr>
<td>CMSC 2613 Programming II</td>
</tr>
<tr>
<td>CMSC 2833 Computer Organization I</td>
</tr>
<tr>
<td>SE 3103 Object Oriented Software Design and Construction</td>
</tr>
<tr>
<td>CMSC 3303 Systems Analysis and Design OR SE 4283 Software Engineering I</td>
</tr>
<tr>
<td>CMSC 3613 Data Structures and Algorithms</td>
</tr>
<tr>
<td>CMSC 4003 Applications of Database Management Systems</td>
</tr>
<tr>
<td>CMSC 4023 Programming Languages OR CMSC 4173 Translator Design</td>
</tr>
<tr>
<td>CMSC 4153 Operating Systems</td>
</tr>
<tr>
<td>CMSC 4513 Software Design and Development</td>
</tr>
<tr>
<td>MATH 2313 Calculus 1</td>
</tr>
<tr>
<td>MATH 2323 Calculus 2</td>
</tr>
<tr>
<td>STAT 2113 Statistical Methods OR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>American Historical and Political Analysis</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>American National Government</td>
<td>3</td>
</tr>
<tr>
<td>American History</td>
<td>3</td>
</tr>
<tr>
<td>Cultural and Language Analysis</td>
<td>3-4</td>
</tr>
<tr>
<td>Second Language</td>
<td>4</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>Cultural Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Social and Behavioral Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Life Skills</td>
<td>5</td>
</tr>
<tr>
<td>Required Health Course</td>
<td>2</td>
</tr>
<tr>
<td>Elective Life Skills</td>
<td>3</td>
</tr>
</tbody>
</table>

**Minimum Required Hours**

- ^MATH 2103 Introduction to Statistics for Sciences OR ^MATH 4113 Mathematical Statistics I

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

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

### Elective CMSC or SE courses

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

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

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

**Applied Area of Study**  
18

### Minor

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

**OR**

### Second Major

The student will complete a second major.

**OR**

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

If less than 18 hours are transferred under this category, the student should take 2/3/4000 level CMSC electives to make up the difference. A student may take additional CMSC 3/4000 electives to bring the total hours of upper-division courses to 40.
<table>
<thead>
<tr>
<th>Program:</th>
<th>Computer Science - continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major:</td>
<td>Computer Science - Applied</td>
</tr>
<tr>
<td>Degree:</td>
<td>Bachelor of Science (B.S.)</td>
</tr>
<tr>
<td>Dept:</td>
<td>Computer Science</td>
</tr>
<tr>
<td>College:</td>
<td>Mathematics and Science</td>
</tr>
<tr>
<td>Major Code:</td>
<td>6101</td>
</tr>
</tbody>
</table>

**Minimum Required Hours**

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
## Program: Computer Science

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

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

**Specific courses within the University Core are listed on pages 96-97.**
- Courses from the major may apply to the areas marked in the University Core.

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

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

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

### Support Courses

<table>
<thead>
<tr>
<th>Required Hours</th>
<th>Minimum Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Support Courses</th>
<th></th>
</tr>
</thead>
</table>
| **Major Support Courses** ..................................................0-12**

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

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

**CMSC 1053 Professional Computer Applications and Problem Solving**

**Advanced Placement High School Programming Course ** **OR**

**CMSC 1513 Beginning Programming**

**^MATH 1533 Algebra for STEM OR Placement Score AND**

**^MATH 1593 Plane Trigonometry OR Placement Score**

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

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

### Major Requirements

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

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Minimum Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Requirements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>^CMSC 1613 Programming I</td>
<td>64</td>
</tr>
<tr>
<td>^CMSC 1621 Programming I Laboratory</td>
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</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 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</td>
<td></td>
</tr>
<tr>
<td>^CMSC 3413 Enterprise Programming</td>
<td></td>
</tr>
<tr>
<td>^CMSC 3613 Data Structures and Algorithms</td>
<td></td>
</tr>
<tr>
<td>^CMSC 4003 Applications of Database Management Systems</td>
<td></td>
</tr>
<tr>
<td>^CMSC 4063 Networks</td>
<td></td>
</tr>
<tr>
<td>^CMSC 4153 Operating Systems</td>
<td></td>
</tr>
<tr>
<td>^CMSC 4323 Computer and Network Security</td>
<td></td>
</tr>
<tr>
<td>^CMSC 4513 Software Design and Development</td>
<td></td>
</tr>
<tr>
<td>^MATH 2313 Calculus I</td>
<td></td>
</tr>
<tr>
<td>^MATH 2323 Calculus 2</td>
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<tr>
<td>^STAT 2103 Introduction to Statistics for Sciences</td>
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<tr>
<td>^STAT 4113 Mathematical Statistics I</td>
<td></td>
</tr>
<tr>
<td>ACCT 2113 Accounting I</td>
<td></td>
</tr>
<tr>
<td>ACCT 2113 Accounting II</td>
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<tr>
<td>MGMT 3103 Principles of Management</td>
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</tr>
<tr>
<td>ISOM 3263 Management Information Systems</td>
<td></td>
</tr>
</tbody>
</table>

| Elective CMSC or SE courses..................................................9**

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

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

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

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

Selected from the following:

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

- CONTINUED ON NEXT PAGE -
<table>
<thead>
<tr>
<th>Program:</th>
<th>Computer Science - continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major:</td>
<td>Computer Science - Information Science</td>
</tr>
<tr>
<td>Degree:</td>
<td>Bachelor of Science (B.S.)</td>
</tr>
<tr>
<td>Dept:</td>
<td>Computer Science</td>
</tr>
<tr>
<td>College:</td>
<td>Mathematics and Science</td>
</tr>
<tr>
<td>Major Code:</td>
<td>6102</td>
</tr>
</tbody>
</table>

- CONTINUED FROM PREVIOUS PAGE -

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Engineering Physics  
Major: Engineering Physics - Electrical Engineering  
Degree: Bachelor of Science (B.S.)  
Dept: Engineering and Physics  
College: Mathematics and Sciences  
Major Code: 6246

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.  
* Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication ........................................... 9
Quantitative Reasoning/Scientific Method ................................. 10-11
  • Math ........................................................................ 3
  Life Science .................................................................... 4
  • Physical Science .......................................................... 3-4
Critical Inquiry and Aesthetic Analysis ...................................... 6
  Aesthetic Analysis ............................................................ 3
  • Critical Inquiry ............................................................. 3
  
Support Courses ...........................................................................9-18
PHIL  1123  Contemporary Moral Problems
ECON  1103  Introduction to Economics
FMKT  2323  Global Protocol and Diversity
(or Foreign Language)
*MATH  1533  Algebra for STEM OR Placement Score AND
*MATH  1593  Plane Trigonometry OR Placement Score

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

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

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

Major Requirements

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

Physics ......................................................................................... 14
Required courses:
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

Engineering ..................................................................................... 55
Required courses:
ENGR  1112  Introduction to Engineering and Laboratory
ENGR  1213  Engineering Computing and Laboratory
ENGR  2033  Statics
ENGR  2303  Electrical Science
ENGR  2311  Electrical Science Laboratory
#ENGR  3183  Electromagnetic Fields I
ENGR  3223  Digital Logic Design and Laboratory
ENGR  3303  Engineering Probability & Statistics
#ENGR  3323  Signals and Systems

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

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

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

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

Support Courses

ENGR  3331  Signals and Systems Laboratory
ENGR  3403  Analog Electronics
ENGR  3421  Analog Electronics Laboratory
#ENGR  3413  Materials Science
ENGR  3613  Microprocessors and Laboratory
ENGR  3703  Computational Methods in Engineering
ENGR  3803  Electrical Power Systems
#ENGR  4323  Digital and Analog Communication
#ENGR  4333  Digital Signal Processing
ENGR  4351  Digital Signal Processing Laboratory
#ENGR  4803  Mechatronics & Laboratory
#ENGR  4882  Senior Engineering Design I
#ENGR  4892  Senior Engineering Design II

Mathematics .................................................................................... 15
Required courses:
MATH  2313  Calculus 1
MATH  2323  Calculus 2
MATH  2333  Calculus 3
MATH  2343  Calculus 4
MATH  3103  Differential Equations

Chemistry ......................................................................................... 5
Required courses:
CHEM  1315  Chemistry for Engineering and Lab

Engineering Electives ........................................................................ 3
Select from the following:
*ENGR  4183  Electromagnetic Fields II
ENGR  4263  Engineering Optics
ENGR  4303  Control Systems
*ENGR  4613  Photonics
*ENGR  4633  Solid State Devices

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

* Admission into Engineering and Physics Upper Division is required.

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

- CONTINUED FROM PREVIOUS PAGE -

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

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.

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

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

CHEM 1103  General Chemistry I OR (for Biomedical Engineering)
CHEM 1315  Chemistry for Engineering and Lab (for Engineering Physics-Electrical Engineering, Mechanical Engineering, and Physics)

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

University of Central Oklahoma Undergraduate Catalog 2017-2018

Specific courses within the University Core are listed on pages 96-97.
* Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication ................................................. 9
Quantitative Reasoning/Scientific Method .................................. 10-11
- Math ................................................................. 3
- Life Science ...................................................... 4
- Physical Science .................................................. 3-4

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

Support Courses ........................................................................ 9-18
- PHIL 1123 Contemporary Moral Problems
- ECON 1103 Introduction to Economics
- FMKT 2323 Global Protocol and Diversity
  (or Foreign Language)
- *MATH 1533 Algebra for STEM OR Placement Score AND
  *MATH 1593 Plane Trigonometry OR Placement Score
- * A grade of ‘C’ or better is required for both MATH 1533 and 1593 to
take MATH 2313.

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

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

Major Requirements

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

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

Engineering ............................................................................... 57
- Required courses:
  ENGR 1112 Introduction to Engineering and Laboratory
  ENGR 1213 Engineering Computing and Laboratory
  ENGR 2033 Statics
  ENGR 2043 Dynamics
  ENGR 2143 Strength of Materials
  ENGR 2151 Strength of Materials Lab
  ENGR 2303 Electrical Science
  ENGR 2311 Electrical Science Laboratory
  ENGR 3203 Thermodynamics
  ENGR 3211 Thermal Engineering Laboratory
  ENGR 3303 Engineering Probability and Statistics

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

Degree: Bachelor of Science (B.S.)
Dept: Engineering and Physics
College: Mathematics and Science
Major Code: 6247

Minimum Required Hours

Support Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 1123</td>
<td>Contemporary Moral Problems</td>
<td>3</td>
</tr>
<tr>
<td>ECON 1103</td>
<td>Introduction to Economics</td>
<td>3</td>
</tr>
<tr>
<td>FMKT 2323</td>
<td>Global Protocol and Diversity (or Foreign Language)</td>
<td>3</td>
</tr>
<tr>
<td>*MATH 1533</td>
<td>Algebra for STEM OR Placement Score AND</td>
<td>3</td>
</tr>
<tr>
<td>*MATH 1593</td>
<td>Plane Trigonometry OR Placement Score</td>
<td>3</td>
</tr>
</tbody>
</table>

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

Chemistry ............................................................................ 5
- Required courses:
  CHEM 1315 Chemistry for Engineering and Lab

Physics or Engineering Electives ........................................... 6
- Selected from the following:
  ENGR 3153 Machine Dynamics
  ENGR 3223 Digital Logic Design and Laboratory
  ENGR 4103 Finite Element Analysis
  ENGR 4153 Vibration
  ENGR 4203 Refrigeration and Air Conditioning
  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.

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

- CONTINUED FROM PREVIOUS PAGE -

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

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.

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

Upper division admission is open to students meeting Engineering and Physics upper division admission requirements. To be admitted into upper division, the student must have:
- A minimum retention grade point average (GPA) of 2.00 in all course work completed by the time the student is formally admitted into upper division.
- Completed 60 semester credit hours by the time the student is formally admitted into upper division.
- Completed the following courses or their equivalent with a minimum grade of “C” by the time the student is formally admitted into upper division:

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

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

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

University Core  (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.  
• Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication ........................................ 9
Quantitative Reasoning/Scientific Method ................................ 10-11
• Math.............................................................................. 3
Life Science ....................................................................... 4
• Physical Science ................................................................ 3-4
Critical Inquiry and Aesthetic Analysis ................................. 6
Aesthetic Analysis ................................................................ 3
• Critical Inquiry .................................................................. 3

Support Courses  

Support Courses .............................................................. 9-18
PHIL 1123 Contemporary Moral Problems
ECON 1103 Introduction to Economics
FMKT 2323 Global Protocol and Diversity  
(or Foreign Language)
*MATH 1533 Algebra for STEM OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

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

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

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

Major Requirements

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

Physics ........................................................................ 23
Required courses.......................................................... 17
PHY 2014 Physics for Science and Engineering I and Lab
PHY 2114 Physics for Science and Engineering II and Lab
PHY 3103 Modern Physics
PHY 3883 Mathematical Physics I
*PHY 4203 Quantum Mechanics
*Physics or Engineering Elective .................................... 3
4000-level PHY, ENGR, or BME course
*Physics Elective ............................................................... 3
4000-level PHY course

Engineering .................................................................. 48
Required courses......................................................... 45
ENGR 1112 Introduction to Engineering and Laboratory
ENGR 1213 Engineering Computing and Laboratory
ENGR 2033 Statics
ENGR 2043 Dynamics
ENGR 2303 Electrical Science

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

Life Skills Required Hours

ENGR 2311 Electrical Science Laboratory
#ENGR 3183 Electromagnetic Fields I
ENGR 3203 Thermodynamics
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
#ENGR 3443 Fluid Mechanics
ENGR 3703 Computational Methods in Engineering
ENGR 4263 Engineering Optics
#ENGR 4882 Senior Engineering Design I
#ENGR 4892 Senior Engineering Design II

Engineering Electives ..................................................... 3
Any 2000-level, 3000-level, or 4000-level ENGR or BME course

Mathematics .................................................................. 15
Required courses:
MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 2343 Calculus 4
MATH 3103 Differential Equations

Chemistry ....................................................................... 5-10
Required courses:
CHEM 1315 Chemistry for Engineering and Lab
OR
CHEM 1103 General Chemistry I AND
CHEM 1112 General Chemistry I Recitation/Laboratory AND
CHEM 1223 General Chemistry II AND
CHEM 1232 General Chemistry II Recitation/Laboratory

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

# Admission into Engineering and Physics Upper Division is required.

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

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

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.

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

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

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

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

University of Central Oklahoma Undergraduate Catalog 2017-2018

Department: Funeral Service  
College: Mathematics and Science  
Major Code: 6120

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
* Courses from the major may apply to the areas marked in the University Core.

Written and Oral Communication ................................................. 9
Quantitative Reasoning/Scientific Method .................................. 10-11
 Math ................................................................. 3
 Life Science ....................................................... 4
* Physical Science ...................................................... 3-4

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

Minimum Required Hours

Major Requirements

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

Required Course
ACCT 2223 Survey of Accounting OR
ACCT 2113 Accounting I
* FNRL 4522 Board Review

Basic Sciences ................................................................. 15

Required courses:
BIO 2314 Introduction to Microbiology and Lab
CHEM 1014 Introduction to Chemistry and Lab
FNRL 2214 Introduction to Human Anatomy and Dissection
FNRL 3433 Introduction to Pathology

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

Required courses:
FNRL 3054 Embalming Chemistry
FNRL 3204 Embalming
FNRL 3304 Restorative Art
* FNRL 4118 Practicum in Embalming & Funeral Directing

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

Required courses:
FNRL 1211 Orientation to Funeral Service
FNRL 2313 Contemporary Funeral Service
FNRL 3374 Funeral Home Management I
FNRL 3383 Funeral Service Statutory Law
FNRL 3393 Mortuary Jurisprudence
FNRL 3493 Funeral Service Communication
FNRL 3513 History of Funeral Directing
FNRL 4214 Funeral Home Management II
FNRL 3483 Psychology of Grief

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

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

Minimum Grade Requirements

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

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

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 pages 67-68 of the 2017-2018 catalog.

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

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

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

Department of Funeral Service Objectives
1. To enlarge the background and knowledge of students about the funeral service profession.
2. To educate students concerning the responsibilities of the funeral service profession.
3. To develop proficiency and skills necessary for the profession, as defined in the Department of Funeral Service Objectives.
4. To provide a curriculum at the post-secondary level of instruction.
5. To encourage student and faculty research in the field of funeral service.

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

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

University of Central Oklahoma Undergraduate Catalog 2017-2018

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

University Core  (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
• Courses from the major may apply to the areas marked in the University Core.

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

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

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

Prerequisite Courses

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

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

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

Major Requirements

Mathematics .........................................................47

Required ..........................................................30

MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 2343 Calculus 4
MATH 2753 Technology for Professional Math and Statistics
MATH 3113 Foundations of Advanced Math
MATH 3143 Linear Algebra
MATH 3183 Introduction to Modern Algebra
MATH 4143 Introduction to Analysis 1
STAT 4113 Mathematical Statistics 1

Electives ........................................................... 17
At least nine (9) hours must be selected from the following:
MATH 3103 Differential Equations
MATH 3163 Elementary Number Theory
MATH 4153 Introduction to Analysis 2
MATH 4483 History of Mathematics
STAT 4123 Mathematical Statistics 2
All other elective courses must be selected from 3000 and 4000 level MATH courses (including those MATH courses listed above).

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

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

Minimum Grade Requirements

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
### University Core (Total Listed 42-44)

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

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

<table>
<thead>
<tr>
<th>Area</th>
<th>Minimum Hours</th>
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</thead>
<tbody>
<tr>
<td>Written and Oral Communication</td>
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<tr>
<td>Quantitative Reasoning/Scientific Method</td>
<td>10-11</td>
</tr>
<tr>
<td>Critical Inquiry and Aesthetic Analysis</td>
<td>6</td>
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</tbody>
</table>

#### Prerequisite Courses

**Prerequisite Courses**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Minimum</th>
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<tbody>
<tr>
<td>MATH 1533</td>
<td>Algebra for STEM OR Placement Score AND</td>
<td>0-6</td>
</tr>
<tr>
<td>MATH 1593</td>
<td>Plane Trigonometry OR Placement Score</td>
<td></td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 2313</td>
<td>Calculus 1</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2323</td>
<td>Calculus 2</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2333</td>
<td>Calculus 3</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2343</td>
<td>Calculus 4</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2753</td>
<td>Technology for Professional Math and Statistics</td>
<td>3-4</td>
</tr>
<tr>
<td>MATH 3113</td>
<td>Foundations of Advanced Math</td>
<td>3</td>
</tr>
<tr>
<td>MATH 3143</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 3183</td>
<td>Introduction to Modern Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 4143</td>
<td>Introduction to Analysis 1</td>
<td>3</td>
</tr>
</tbody>
</table>

**Applied Mathematics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 2113</td>
<td>Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>MATH 3103</td>
<td>Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 4113</td>
<td>Operations Research 1</td>
<td>3</td>
</tr>
<tr>
<td>STAT 4113</td>
<td>Mathematical Statistics 1</td>
<td>3</td>
</tr>
<tr>
<td>MATH 4263</td>
<td>Numerical Linear Algebra OR</td>
<td>3</td>
</tr>
<tr>
<td>MATH 4363</td>
<td>Applied Numerical Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Any 3000 and 4000 level MATH or STAT course to bring the total to 21.

**Electives to bring total to**

It is strongly recommended that PHY 1114 General Physics I and Lab be taken in the general education pattern.
Program: Mathematics  
Major: Mathematics - Statistics  
Degree: Bachelor of Science (B.S.)  

Department: Mathematics and Statistics  
College: Mathematics and Science  
Major Code: 6162

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.  
• Courses from the major may apply to the areas marked in the University Core.

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

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

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

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

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

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

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

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

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

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

Major Requirements

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

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

Required ................................................................................... 27
  MATH 2313  Calculus 1
  MATH 2323  Calculus 2
  MATH 2333  Calculus 3
  MATH 2343  Calculus 4
  MATH 2753  Technology for Professional Math and Statistics
  MATH 3103  Differential Equations
  MATH 3113  Foundations of Advanced Math
  MATH 3143  Linear Algebra
  MATH 3183  Introduction to Modern Algebra

Electives .................................................................................... 3
  Selected from 3000 and 4000 level MATH courses.

Statistics .................................................................................. 24

Required Courses:
  STAT 2113  Statistical Methods
  STAT 4103  Applied Experimental Design
  STAT 4113  Mathematical Statistics 1
  STAT 4123  Mathematical Statistics 2
  STAT 4213  Applied Regression Analysis
  STAT 4253  Computer Applications in Statistics
  STAT 4313  Nonparametric Statistics
  STAT 4513  Statistical Consulting

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

Minimum Grade Requirements

1. Average in (a) all college course work, (b) course work at UCO, and (c) major courses .................................................. 2.50

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
University Core  (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
- Courses from the major may apply to the areas marked in the University Core.
- Written and Oral Communication .................................................. 9
- Quantitative Reasoning/Scientific Method ...................................... 10-11
  - Math .................................................................................. 3
  - Life Science ......................................................................... 4
  - Physical Science .................................................................... 3-4
- Critical Inquiry and Aesthetic Analysis ........................................ 6
  - Aesthetic Analysis ................................................................... 3
  - Critical Inquiry ....................................................................... 3

Support and Prerequisite Courses

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

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

Major Requirements

Mathematics Education ...............................................................41-42
- Required courses ..................................................................... 36
  - MATH 2313 Calculus 1
  - MATH 2323 Calculus 2
  - MATH 2333 Calculus 3
  - MATH 2343 Calculus 4
  - MATH 2743 Technology and Mathematics Education
  - MATH 3113 Foundations of Advanced Mathematics
  - MATH 3123 College Geometry
  - MATH 3143 Linear Algebra
  - MATH 3163 Elementary Number Theory
  - MATH 3183 Introduction to Modern Algebra
  - MATH 4483 History of Mathematics
- STAT 2113 Statistical Methods
  - Mathematics Electives .............................................................. 5-6
  - Select at least two of the following:
    - MATH 2023 Foundations of Geometry and Measurement
    - MATH 3103 Differential Equations
    - MATH 4143 Introduction to Analysis 1
    - MATH 4960 Institute in Mathematics (2 hours)
    - STAT 4113 Mathematical Statistics 1

Professional Education ...............................................................32
- PTE 1010 Introduction to Teacher Education
- PTE 3023 Foundations of American Education/Clinical Exp
- PTE 3153 Adolescent Psychology

Minimum Graduation Requirements

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Nursing
Major: Nursing
Degree: Bachelor of Science (B.S.)

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

University of Central Oklahoma Undergraduate Catalog 2017-2018

Minimum Required Hours: 238

University Core (Total Listed 42-44)

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

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

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

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

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

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

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

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

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

Major Requirements

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

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

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

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

Professional ................................................................. 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

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

- CONTINUED ON NEXT PAGE -
Admission to Nursing Program

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

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

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

A. Transcript(s) reflecting a minimum retentive grade point average of 2.50 in all course work completed at the time of the application.

B. A minimum grade of “C” in chemistry, all biological sciences, NURS 1221 and NURS 2113 is required. Two of the five required science courses must be successfully completed prior to the application deadline. Students may enroll a maximum of two times in any nursing course.

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

D. Submit a criminal background check (OSBI).

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

F. International students (i.e. students for whom English is a second language regardless of resident status) must have a minimum TOEFL score of 83 on the internet version or equivalent on the written examination (560) or computer version (220).

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.

Career Ladder Students

RN to BS

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

Transfer Students

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

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

University Core (Total Listed 42-44)

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

- Courses from the major may apply to the areas marked in the University Core.
- Written and Oral Communication ................................................. 9
- Quantitative Reasoning/Scientific Method ........................................ 10-11
  • Math ........................................................................... 3
  • Life Science ................................................................. 4
  • Physical Science ......................................................... 3-4
- Critical Inquiry and Aesthetic Analysis ......................................... 6
  Aesthetic Analysis ................................................................ 3
  Critical Inquiry .................................................................... 3

Support Courses

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

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

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

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

Major Requirements

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

Biology .............................................................................. 26

Required courses:
BIO 1204 Biology I for Majors
BIO 1225 Biology II for Majors and Lab
BIO 2203 Cell Biology
BIO 2211 Cell Biology Laboratory
BIO 3054 Microbiology for Majors and Lab
BIO 3303 Genetics
BIO 3543 General Ecology
BIO 3703 Evolution

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

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

Required courses:
MATH 2153 BioCalculus
STAT 2103 Introduction to Statistics for Sciences

Elective 3000/4000 Biology ....................................................... 15
Any 3000/4000 level BIO course

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

BIO 3000 Workshop in Biology
BIO 3990 Advanced Topics in Biology
BIO 4900 Practicum in Biology
BIO 4930 Individual Study in Biology
BIO 4950 Internship in Biology
BIO 4960 Institute in Biology
BIO 4970 Study Tour in Biology

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

PTE 1010 Introduction to Teacher Education
PTE 3023 Foundations of American Education/Clinical Exp
PTE 3153 Adolescent Psychology
SPED 4123 Teaching Individuals with Disabilities
^BIO 4812 Teaching and Learning in Science Classrooms
^BIO 4853 General Methods of Teaching Science and Lab
^PTE 4172 Educational Assessment
^PTE 4533 Educational Psych/Clinical Experience
^PTE 4811 Contemporary Issues
^PTE 4838 Internship/Student Teaching Secondary
^PTE 4853 Classroom Management & Instruction

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

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

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

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

**Minimum Graduation Requirements**

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
- Courses from the major may apply to the areas marked in the University Core.
- Written and Oral Communication........................................... 9
- Quantitative Reasoning/Scientific Method .............................. 10-11
  - Math.................................................................................. 3
  - Life Science........................................................................ 4
  - Physical Science.................................................................... 3-4
- Critical Inquiry and Aesthetic Analysis.................................. 6
  Aesthetic Analysis..................................................................... 3
  Critical Inquiry......................................................................... 3

Support Courses

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

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

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

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

Major Requirements

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

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

Biology .................................................................................. 9
  Required courses:
  BIO 1204 Biology I for Majors
  BIO 1225 Biology II for Majors and Lab

Chemistry................................................................................. 10
  Required courses:
  CHEM 1103 General Chemistry I AND
  CHEM 1112 General Chemistry I Recitation/Lab
  CHEM 1223 General Chemistry II AND
  CHEM 1232 General Chemistry II Recitation/Lab

Physics ....................................................................................... 8
  Required courses:
  PHY 1114 General Physics I and Lab OR
  PHY 2014 Physics for Science and Engineering I and Lab
  PHY 1214 General Physics II and Lab OR
  PHY 2114 Physics for Science and Engineering II and Lab

Earth Science .............................................................................. 4
  PHY 3014 Earth Science

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

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

Elective Courses........................................................................ 22

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

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

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

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

Minimum Required Hours

Minimum 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 .................................. 2.75
2. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major)...............“C”
3. Proficiency in foreign language.......................................Novice 4 level

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Science Education
Major: Science Education - General Science
Degree: Bachelor of Science in Education (B.S.Ed.)

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

University of Central Oklahoma Undergraduate Catalog 2017-2018

Specific courses within the University Core are listed on pages 96-97. Courses from the major may apply to the areas marked in the University Core.

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

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

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

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

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

**Support Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCOM 1113</td>
<td>Fundamentals of Speech</td>
</tr>
<tr>
<td>ENG 1113</td>
<td>English Composition</td>
</tr>
<tr>
<td>ENG 1213</td>
<td>English Composition and Research</td>
</tr>
</tbody>
</table>

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

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

MATH 1513 College Algebra AND
MATH 1593 Plane Trigonometry

**Major Requirements**

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

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

- Biology ............................................................. 9

  Required courses:
  - BIO 1204 Biology I for Majors
  - BIO 1225 Biology II for Majors and Lab

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

  Required courses:
  - CHEM 1103 General Chemistry I AND
  - CHEM 1112 General Chemistry I Recitation/Lab
  - CHEM 1223 General Chemistry II AND
  - CHEM 1232 General Chemistry II Recitation/Lab

- Physics .......................................................... 8

  Required courses:
  - PHY 1114 General Physics I and Lab OR
  - PHY 2014 Physics for Science and Engineering I and Lab
  - PHY 1214 General Physics II and Lab OR
  - PHY 2114 Physics for Science and Engineering II and Lab

- Mathematics ....................................................... 3

  Required course:
  - STAT 2103 Introduction to Statistics for Sciences

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

  Required course:
  - PHY 3014 Earth Science

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

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

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

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

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

- 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 3003 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 Educational Psych/Clinical Experience
  ^PTE 4811 Contemporary Issues
  ^PTE 4833 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 .............................................. 2.75
2. Courses in English Composition, Fundamentals of Speech, Professional Education, and area of specialization (major) ....... “C”
3. Proficiency in foreign language ............................................. Novice 4 level

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Science Education
Major: Science Education - Physical Science
Degree: Bachelor of Science in Education (B.S.Ed.)

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

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
• Courses from the major may apply to the areas marked in the University Core.

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

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

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

Support Courses

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

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

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

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

Major Requirements

Science Education - Physical Science ............... 65
Science Education Core ....................................................... 37

Biology ................................................................................. 9
Required courses:
BIO 1204 Biology I for Majors
BIO 1225 Biology II for Majors and Lab

Chemistry ............................................................................... 10
Required courses:
CHEM 1103 General Chemistry I AND
CHEM 1112 General Chemistry I Recitation/Lab
CHEM 1223 General Chemistry II AND
CHEM 1232 General Chemistry II Recitation/Lab

* Physics ................................................................ ................. 8

Required courses:
PHY 1114 General Physics I and Lab OR
PHY 2014 Physics for 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

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

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
SPED 4123 Teaching Individuals with Disabilities
*BIO 4812 Teaching and Learning in Science Classrooms
*BIO 4853 General Methods of Teaching Science and Lab
*PTE 4172 Educational Assessment

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

- CONTINUED FROM PREVIOUS PAGE -

^PTE 4533 Educational Psych/Clinical Experience
^PTE 4811 Contemporary Issues
^PTE 4838 Internship/Student Teaching Secondary
^PTE 4853 Classroom Management & Instruction

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

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

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
Program: Science Education
Major: Science Education - Physics
Degree: Bachelor of Science in Education (B.S.Ed.)

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

University Core (Total Listed 42-44)

Specific courses within the University Core are listed on pages 96-97.
* Courses from the major may apply to the areas marked in the
  University Core.

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

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

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

Support Courses

Support Courses........................................................................9-15
MCOM 1113 Fundamentals of Speech
ENG 1113 English Composition
ENG 1213 English Composition and Research
*MATH 1533 Algebra for STEM OR Placement Score AND
*MATH 1593 Plane Trigonometry OR Placement Score

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

Major Requirements

Science Education - Physics ................................................. 62
Science Education Core .......................................................... 34
Biology .................................................................................. 9
Required courses:
BIO 1204 Biology I for Majors
BIO 1225 Biology II for Majors

Chemistry .................................................................................. 10
Required courses:
CHEM 1103 General Chemistry I AND
CHEM 1112 General Chemistry I Recitation/Lab
CHEM 1223 General Chemistry II AND
CHEM 1232 General Chemistry II Recitation/Lab

Physics ..................................................................................... 8
Required courses:
PHY 2014 Physics for Science and Engineering I and Lab
PHY 2114 Physics for Science and Engineering II and Lab

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

Computer Science ....................................................................... 3
Required course:
CMSC 1513 Beginning Programming

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

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

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

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

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

Math Courses ............................................................................ 15
MATH 2313 Calculus 1
MATH 2323 Calculus 2
MATH 2333 Calculus 3
MATH 2343 Calculus 4
MATH 3103 Differential Equations

Physics and Engineering Courses ............................................. 13
ENGR 2033 Statics
ENGR 2043 Dynamics
ENGR 3303 Engineering Probability and Statistics
ENGR 2303 Electrical Science
ENGR 2311 Electrical Science Lab

Professional Education .............................................................. 31
PTE 1010 Introduction to Teacher Education
PTE 3023 Foundations of American Education/Clinical Exp
PTE 3153 Adolescent Psychology
SPED 4123 Teaching Individuals with Disabilities
*BIO 4812 Teaching and Learning in Science Classrooms
*BIO 4853 General Methods of Teaching Science and Lab
^PTE 4172 Educational Assessment
^PTE 4533 Educational Psych/Clinical Experience
^PTE 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

*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 -
Minimum Graduation Requirements

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.
**Program:** Software Engineering  
**Major:** Software Engineering  
**Degree:** Bachelor of Science (B.S.)  
**Dept:** Computer Science  
**College:** Mathematics and Science  
**Major Code:** 6110

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

Specific courses within the University Core are listed on pages 96-97.  
*Courses from the major may apply to the areas marked in the University Core.

<table>
<thead>
<tr>
<th>Written and Oral Communication</th>
<th>Minimum Required Hours</th>
</tr>
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<tr>
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<table>
<thead>
<tr>
<th>Quantitative Reasoning/Scientific Method</th>
<th>Minimum Required Hours</th>
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<tbody>
<tr>
<td>Math</td>
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<tr>
<td>Life Science</td>
<td>4</td>
</tr>
<tr>
<td>Physical Science</td>
<td>3-4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Critical Inquiry and Aesthetic Analysis</th>
<th>Minimum Required Hours</th>
</tr>
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<tbody>
<tr>
<td>Aesthetic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Critical Inquiry</td>
<td>3</td>
</tr>
</tbody>
</table>

**Support Courses**

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

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

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

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

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

**Major Requirements**

**Software Engineering** 77-80

Required 53

- **CMSC 1613** Programming I
- **CMSC 1621** Programming I Laboratory
- **CMSC 2123** Discrete Structures
- **CMSC 2613** Programming II
- **CMSC 2833** Computer Organization I
- **SE 3103** Object Oriented Software Design and Construction
- **CMSC 3613** Data Structures and Algorithms
- **CMSC 4003** Applications of Database Management Systems
- **SE 4283** Software Engineering I
- **CMSC 4323** Computer and Network Security
- **CMSC 4401** Ethics in Computing
- **SE 4423** Software Engineering II
- **SE 4433** Software Architecture and Design
- **SE 4513** Software Engineering Senior Project *
- **MATH 2313** Calculus 1
- **MATH 2323** Calculus 2
- **MATH 2333** Calculus 3
- **MATH 3143** Linear Algebra
- **STAT 2113** Statistical Methods OR

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

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

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

Any non-required 2/3/4000 level MATH or STAT courses with the following exceptions: MATH 2013, 2053, 2113, 2123, 2133, 2153, 2743, 3323, or 4843.

**Elective Courses** 9

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

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

- System Development
- CMSC 4023 Programming Languages
- CMSC 4063 Networks
- CMSC 4153 Operating Systems
- CMSC 4173 Translator Design
- CMSC 4193 Introduction to Robotics

* 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.

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

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

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

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

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

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

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

For other regulations pertaining to graduation, see pages 67-68 of the 2017-2018 catalog.