

*College of
Mathematics and
Science*

*Academic Degree Programs,
Minors and Certificate*

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

**Minimum
Required Hours**

Prerequisite Courses
Prerequisite Courses 0-6

Required courses:

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

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

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

Major Requirements

Actuarial Science..... 66

Mathematics Core..... 18

Required courses:

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

Actuarial Core..... 12

Required courses:

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

Statistics Core..... 15

Required courses:

- STAT 2113 Statistical Methods
- # STAT 4113 Mathematical Statistics 1
- ** STAT 4123 Mathematical Statistics 2
- # STAT 4213 Applied Regression Analysis
- # STAT 4533 Data Mining & Statistical Learning

Finance and Insurance Electives 15

Select from the following:

- * ACCT 2113 Accounting I

**Minimum
Required Hours**

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

Area of Application 6

Select from the following:

- MATH 3103 Differential Equations
- MATH 4113 Operations Research 1
- MATH 4123 Operations Research 2
- MATH 4263 Numerical Linear Algebra
- MATH 4363 Applied Numerical Analysis
- MATH 4950 Internship (3 hours)
- STAT 4103 Applied Experimental Design
- STAT 4313 Nonparametric Statistics

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

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

Electives to bring total to..... 124

Minimum Grade Requirements

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

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

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

Accelerated BS/MS

The Department of Mathematics and Statistics offers a M.S. program in Applied Mathematical Science. Students in the B.S. Actuarial Science program are eligible to pursue, with approval, an M.S. Applied Mathematical Science degree beginning in their senior year. Approved B.S. students may take up to nine credit hours of 5000-level MATH or STAT courses during their senior year of the B.S. program. These courses will count toward both the B.S. and M.S. degrees. A formal application to the M.S. Applied Mathematical Science program and an approval from the Department of Mathematics and Statistics are required. Requirements are located in the UCO Graduate Catalog under Applied Mathematical Science - Mathematics, Applied Mathematical Science - Statistics, or Applied Mathematical Science - Teaching.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Actuarial Science and the M.S. Applied Mathematical Science programs:

MATH 5113 Operations Research 1
 MATH 5910 Seminar/Special Topics*
 STAT 5103 Applied Experimental Design
 STAT 5123 Mathematical Statistics 2
 STAT 5213 Applied Regression Analysis
 STAT 5263 Computer Applications in Statistics
 STAT 5303 Nonparametric Statistics
 STAT 5413 Data Visualization
 STAT 5533 Data Mining & Statistical Learning
 STAT 5910 Seminar/Special Topics*

*Students are restricted to one (1) cross-listed 5910 course while classified as an ADP student.

Accelerated BS/PSM

UCO's P.S.M. (Professional Science Master's) in Computational Science has partnered with the B.S. in Actuarial Science so that approved students may take up to nine credit hours of 5000-level MATH or STAT courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the Department of Mathematics and Statistics are required. Requirements are located in the UCO Graduate Catalog under Computational Science - Computational Mathematics, P.S.M.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Actuarial Science and the P.S.M. Computational Science - Computational Mathematics :

MATH 5113 Operations Research I
 MATH 5263 Numerical Linear Algebra
 MATH 5373 Applied Numerical Analysis
 STAT 5263 Computer Applications in Statistics
 STAT 5213 Applied Regression Analysis

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

Minimum
Required Hours

Minimum
Required Hours

Support Courses

Support Courses.....0-6

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

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

- MATH 1453 Applied Algebra **OR**
- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry

Major Requirements

Biology.....67

Biology Core (required of all degree candidates) 25

Required Courses:

- BIO 1204 Biology for Majors: Principles
- BIO 1224 Biology for Majors: Diversity
- BIO 2203 Cell Biology
- BIO 2211 Cell Biology Laboratory
- BIO 3054 Microbiology for Majors and Lab
- BIO 3303 Genetics
- BIO 3543 General Ecology
- BIO 3703 Evolution
- *BIO 4840 Capstone

Mathematics 6

Required courses:

- MATH 2153 BioCalculus
- STAT 2103 Intro Statistics for Sciences

Chemistry..... 15

Required courses:

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

Physics..... 4

Required course:

- PHY 1114 General Physics I and Lab

Upper Division Biology Electives

(to bring major total to 67)** 17

** 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 1224, BIO 2211, and BIO 3054.

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

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

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

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

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

**Minimum
Required Hours**

- CONTINUED FROM PREVIOUS PAGE -

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.

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

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

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

**Minimum
Required Hours**

**Minimum
Required Hours**

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 1453 Applied Algebra **OR**
- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry

Major Requirements

Biology-Biomedical Sciences 73

Biology Core 19

Required Courses:

- BIO 1204 Biology for Majors: Principles
- BIO 1224 Biology for Majors: Diversity
- BIO 2203 Cell Biology
- BIO 2211 Cell Biology Laboratory
- BIO 3054 Microbiology for Majors and Lab
- BIO 3303 Genetics
- *BIO 4840 Capstone

Mathematics 6

Required courses:

- MATH 2153 BioCalculus
- STAT 2103 Intro Statistics for Sciences

Chemistry..... 15

Required courses:

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

Physics..... 4

Required course:

- PHY 1114 General Physics I and Lab

****Guided Electives..... 29**

Selected from the following:

- BIO 2504 Human Anatomy & Laboratory
- 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 4264 Mammalogy & Lab
- BIO 4334 Environmental Microbiology & Lab
- BIO 4343 Molecular Biology Techniques & Lab
- BIO 4414 Virology and Lab
- BIO 4454 Molecular Cell Physiology & Lab
- BIO 4504 Mycology & Lab
- BIO 4515 Pathogenic Micro and Immunology & Lab
- BIO 4582 Integrative Biology
- BIO 4622 Methods of Human Dissection & Prosection
- BIO 4743 Population Genetics & Lab
- 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 29 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

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

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

**Minimum
Required Hours**

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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, 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.**

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

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

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

Dept: **Biology**
 College: **Mathematics and Science**
 Major Code: **6002**

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

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

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

**Minimum
Required Hours**

Support Courses

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

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

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

Major Requirements

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

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

Biology and Chemistry **46**

Required Courses:

- BIO 1204 Biology for Majors: Principles
- BIO 1224 Biology for Majors: Diversity
- BIO 2203 Cell Biology
- BIO 2211 Cell Biology Laboratory
- BIO 2604 Human Physiology and Lab
- BIO 3054 Microbiology for Majors and Lab
- BIO 3303 Genetics
- BIO 4515 Pathogenic Microbiology and Immunology and Lab
- CHEM 1103 General Chemistry I
- CHEM 1112 General Chemistry I-Recitation/Lab
- CHEM 1223 General Chemistry II
- CHEM 1232 General Chemistry II-Recitation/Lab
- CHEM 3303 Organic Chemistry I
- CHEM 3312 Organic Chemistry I Lab
- CHEM 3403 Biochemistry I

Mathematics **6**

Required courses:

- MATH 2153 BioCalculus
- STAT 2103 Intro Statistics for Sciences

Elective Biology and/or Chemistry..... **5**

Selected from the following courses:

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

**Minimum
Required Hours**

- BIO 3414 Histology and Lab
- BIO 3803 Mammalian Physiology I
- BIO 3813 Mammalian Physiology II
- BIO 4414 Virology and Lab
- BIO 4774 Parasitology and Lab
- CHEM 3203 Introductory Physical Chemistry
- CHEM 3323 Organic Chemistry II
- CHEM 3332 Organic Chemistry II Lab
- CHEM 3442 Experimental Biochemistry
- CHEM 4103 Biochemistry II

#Medical Technology **30**

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

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

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

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

Minimum Grade Requirements

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

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

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

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

• Social and Behavioral Analysis..... 3

Life Skills 5

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

**Minimum
Required Hours**

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

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

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

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

Major Requirements

Biomedical Engineering.....96-98

Biology11

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

Chemistry..... 5

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

Engineering..... 48

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

**Minimum
Required Hours**

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

Mathematics 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.

Complete all the courses from one of the following

concentrations:.....16-18

Concentration A: (courses in preparation for Pre-Med fields).....18

- Required Courses (Concentration A).....15
- CHEM 1223 General Chemistry II
 - CHEM 1232 General Chemistry II Recitation/Laboratory
 - CHEM 3303 Organic Chemistry I
 - ENGR 3403 Analog Electronics
 - ENGR 3421 Analog Electronics Laboratory
 - ENGR 3223 Digital Logic Design and Laboratory

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

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

**Minimum
 Required Hours**

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Biomedical Engineering Elective (Concentration A).....3
 Any 3000/4000 level BME, PHY, CHEM, or ENGR course with the following exception: PHY 3014, 3044, 3054, or 3503

Concentration B: (courses in preparation for Instrumentation fields)....16
 Required Courses (Concentration B).....10
 ENGR 3223 Digital Logic Design and Laboratory
 ENGR 3403 Analog Electronics
 ENGR 3421 Analog Electronics Laboratory
 PHY 3883 Mathematical Physics I

Biomedical Engineering Elective (Concentration B).....6
 Choose one of the following:
 BME 4243 Modeling and Analysis of Biomedical Systems
 BME 4920 Seminar in Biomedical Engineering
 BME 4930 Individual Study
 BME 4940 Field Study in Biomed Engr
 BME 4950 Internship in Biomedical Engr
 ENGR 3183 Electromagnetic Fields I
 ENGR 3613 Microprocessors and Laboratory
 ENGR 3703 Computational Methods in Engineering
 ENGR 3803 Electrical Power Systems
 ENGR 4263 Engineering Optics
 ENGR 4333 Digital Signal Processing
 ENGR 4803 Mechatronics & Laboratory

AND

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

Concentration C: (courses in preparation for Biomechanics fields)....16
 Required Courses (Concentration C).....10
 ENGR 2043 Dynamics
 ENGR 2143 Strength of Materials
 ENGR 2151 Strength of Materials Laboratory
 ENGR 3443 Fluid Mechanics

Biomedical Engineering Elective (Concentration C).....6
 Choose two of the following:
 BME 4243 Modeling and Analysis of Biomedical Systems
 BME 4920 Seminar in Biomedical Engineering
 BME 4930 Individual Study
 BME 4940 Field Study in Biomed Engr
 BME 4950 Internship in Biomedical Engr
 ENGR 4103 Finite Element Analysis
 ENGR 4153 Vibrations
 ENGR 4313 Fluid Dynamics
 ENGR 4803 Mechatronics & Laboratory

The following courses are strongly recommended electives:
 BME 4243 Modeling and Analysis of Biomedical Systems
 #ENGR 3443 Fluid Mechanics

CHEM 3403 Biochemistry I (for Concentration A)
 CHEM 3323 Organic Chemistry II (for Concentration A)
 #ENGR 3183 Electromagnetic Fields I (for Concentration B)

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

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.**

Admission into Engineering and Physics Upper Division

Students seeking the B.S. in Biomedical Engineering, Electrical Engineering, Mechanical Engineering, and Engineering Physics – Physics are required to make formal application to the Chairperson of the School of Engineering and Physics for admission into the upper division of each of these majors. Applications must be submitted to the School 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)

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

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

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CHEM 1112 General Chemistry I Recitation/Lab AND
 (for Biomedical Engineering)
 CHEM 1103 General Chemistry I OR (for Biomedical
 Engineering)
 CHEM 1315 Chemistry for Engineering and Lab (for
 Electrical Engineering, Mechanical Engineering, and
 Engineering Physics - Physics)

Formal approval by the school Faculty Advisor and School 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 School of Engineering and Physics.

Accelerated BS/MS

The School of Engineering and Physics offers a M.S. Engineering Physics - Biomedical Engineering major. Students in the B.S. Biomedical Engineering program are eligible to pursue, with approval, the M.S. Engineering Physics - Biomedical Engineering degree beginning in their senior year. Approved B.S. Biomedical Engineering students may take up to nine credit hours of 5000-level BME courses during their senior year of the B.S. program. These courses will count toward both the B.S. and M.S. degrees. A formal application to the M.S. Engineering Physics program and an approval from the School of Engineering and Physics are required. Requirements are located in the UCO Graduate Catalog under Engineering Physics - Biomedical Engineering.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Biomedical Engineering and the M.S. Engineering Physics - Biomedical Engineering programs:

BME 5223 Biomedical Imaging
 BME 5233 Biomedical Instrumentation
 BME 5343 Biomechanics

Accelerated BS/PSM

UCO's P.S.M. (Professional Science Master's) in Computational Science has partnered with the B.S. in Biomedical Engineering so that approved students may take up to 10 credit hours of 5000-level ENGR courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the School of Engineering and Physics are required. Requirements for the P.S.M. program are located in the UCO Graduate Catalog under Computational Science - Computational Engineering, P.S.M.

Up to 10 credit hours of the following courses can be used to satisfy both the B.S. Biomedical Engineering and the P.S.M. Computational Science - Computational Engineering:

ENGR 5023 Heat Transfer
 ENGR 5103 Finite Element Analysis
 BME 5223 Biomedical Imaging
 ENGR 5333 Digital Signal Processing
 ENGR 5311 Digital Signal Processing Laboratory
 ENGR 5803 Mechatronics & Laboratory

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

• Math 3

Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2

Elective Life Skills 3

Minimum
Required Hours

Minimum
Required Hours

Support Courses

Support Courses 0-6

Required Courses:

*MATH 1533 Precalculus-Algebra **OR**

MATH 1513 College Algebra **OR** Placement Score **AND**

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

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

Major Requirements

Chemistry 68

Common Core 47

Required courses:

CHEM 1103 General Chemistry I

CHEM 1112 General Chemistry I - Recitation/Lab

CHEM 1223 General Chemistry II

CHEM 1232 General Chemistry II - Recitation/Lab

CHEM 2104 Quantitative Analysis and Lab

CHEM 2621 Professionalism in Chemistry I

CHEM 3303 Organic Chemistry I

CHEM 3312 Organic Chemistry I Lab

CHEM 3323 Organic Chemistry II

CHEM 3332 Organic Chemistry II Lab

CHEM 3454 Fundamentals of Instrumental Analysis and Lab

CHEM 3621 Professionalism in Chemistry II

MATH 2313 Calculus 1

MATH 2323 Calculus 2

MATH 2333 Calculus 3

PHY 2014 Physics for Science and Engineering I and Lab

PHY 2114 Physics for Science and Engineering II and Lab

Advanced Chemistry 21

Required courses: 15

CHEM 3403 Biochemistry I

CHEM 3503 Physical Chemistry I

CHEM 3513 Physical Chemistry II

CHEM 3602 Experimental Physical Chemistry

CHEM 4502 Directed Research and Lab (taken twice)

Chemistry Electives (3000/4000 level) 6
 (CHEM 3013 and CHEM 3203 will not apply)

Electives to bring total to 124

The following are highly recommended:

ENG 4023 Technical Writing

MATH 2343 Calculus 4

PHY 3103 Modern Physics

Minimum Grade Requirements

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

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2

Elective Life Skills 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses 0-6

Required Courses:

*MATH 1533 Precalculus-Algebra **OR**

MATH 1513 College Algebra **OR** Placement Score **AND**

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

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

Major Requirements

Chemistry - ACS Certificate 75

Common Core 47

Required courses:

CHEM 1103 General Chemistry I

CHEM 1112 General Chemistry I - Recitation/Lab

CHEM 1223 General Chemistry II

CHEM 1232 General Chemistry II - Recitation/Lab

CHEM 2104 Quantitative Analysis and Lab

CHEM 2621 Professionalism in Chemistry I

CHEM 3303 Organic Chemistry I

CHEM 3312 Organic Chemistry I Lab

CHEM 3323 Organic Chemistry II

CHEM 3332 Organic Chemistry II Lab

CHEM 3454 Fundamentals of Instrumental Analysis and Lab

CHEM 3621 Professionalism in Chemistry II

MATH 2313 Calculus 1

MATH 2323 Calculus 2

MATH 2333 Calculus 3

PHY 2014 Physics for Science and Engineering I and Lab

PHY 2114 Physics for Science and Engineering II and Lab

Advanced Chemistry ACS approved 28

Required courses: 22

CHEM 3403 Biochemistry I

CHEM 3503 Physical Chemistry I

CHEM 3513 Physical Chemistry II

CHEM 3602 Experimental Physical Chemistry

CHEM 4502 Directed Research and Lab (taken twice)

CHEM 4603 Advanced Organic Chemistry

CHEM 4654 Inorganic Chemistry and Lab

Elective Chemistry (3000/4000 level) 6

(CHEM 3013 and CHEM 3203 will not apply.)

Electives to bring total to 124

The following are highly recommended:

ENG 4023 Technical Writing

MATH 2343 Calculus 4

PHY 3103 Modern Physics

Minimum Grade Requirements

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

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

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

Dept: **Chemistry**
 College: **Mathematics and Science**
 Major Code: **6063**

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

• Life Science..... 4

• Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis..... 6

Aesthetic Analysis..... 3

Critical Inquiry..... 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language..... 4

OR

Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

Required Health Course..... 2

Elective Life Skills..... 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....0-6

Required Courses:

MATH 1453 Applied Algebra **OR**

MATH 1533 Precalculus-Algebra **OR**

MATH 1513 College Algebra **OR** Placement Score **AND**

MATH 1593 Plane Trigonometry **OR** Placement Score

Elective Chemistry (3000/4000 level) 3

(CHEM 3013 will not apply.)

Additional Electives 6

Selected from the following:

BIO 3543 General Ecology

GEO 3253 Intro to Environ Biogeography

GEO 3703 Environmental Conservation

GEO 4113 Geographic Information Systems

GEO 4743 Environmental GIS

HIST 3723 American Environmental History

HIST 3743 Global Environmental History

POL 4423 Environmental Politics

Other electives as approved by the department

Major Requirements

Chemistry - Environmental Chemistry..... 77

Common Core 53

Required courses:

CHEM 1103 General Chemistry I

CHEM 1112 General Chemistry I - Recitation/Lab

CHEM 1223 General Chemistry II

CHEM 1232 General Chemistry II - Recitation/Lab

CHEM 2104 Quantitative Analysis and Lab

CHEM 2621 Professionalism in Chemistry I

CHEM 3303 Organic Chemistry I

CHEM 3312 Organic Chemistry I Lab

CHEM 3323 Organic Chemistry II

CHEM 3332 Organic Chemistry II Lab

CHEM 3454 Fundamentals of Instrumental Analysis and Lab

CHEM 3621 Professionalism in Chemistry II

BIO 1204 Biology for Majors: Principles

BIO 1224 Biology for Majors: Diversity

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..... 24

Required courses:..... 15

CHEM 3353 Environmental Chemistry

CHEM 3203 Introductory Physical Chemistry

CHEM 3403 Biochemistry I

CHEM 4454 Environmental Chemical Analysis and Lab

CHEM 4892 Capstone for Chemistry

Electives to bring total to..... 124

The following are highly recommended:

CHEM 4654 Inorganic Chemistry and Lab

ENG 4023 Technical Writing

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.

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

• Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2

Elective Life Skills 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses 0-6

Required Courses:

MATH 1453 Applied Algebra **OR**

MATH 1513 College Algebra **OR** Placement Score **OR**

MATH 1533 Precalculus-Algebra **OR** Placement Score **AND**

MATH 1593 Plane Trigonometry **OR** Placement Score

Major Requirements

Chemistry - Health Sciences 75

Common Core 55

Required courses:

CHEM 1103 General Chemistry I

CHEM 1112 General Chemistry I Recitation/Lab

CHEM 1223 General Chemistry II

CHEM 1232 General Chemistry II Recitation/Lab

CHEM 2104 Quantitative Analysis and Lab

CHEM 2621 Professionalism in Chemistry I

CHEM 3303 Organic Chemistry I

CHEM 3312 Organic Chemistry I Lab

CHEM 3323 Organic Chemistry II

CHEM 3332 Organic Chemistry II Lab

CHEM 3454 Fundamentals of Instrumental Analysis and Lab

CHEM 3621 Professionalism in Chemistry II

BIO 1204 Biology for Majors: Principles

BIO 1224 Biology for Majors: Diversity

BIO 2203 Cell Biology

MATH 2153 Bio-Calculus

PHY 1114 General Physics I and Lab

PHY 1214 General Physics II and Lab

STAT 2103 Intro Statistics for Sciences

Advanced Course work 20

Required courses: 14

BIO 3054 Microbiology for Majors and Lab

CHEM 3203 Introductory Physical Chemistry

CHEM 3403 Biochemistry I

CHEM 3442 Experimental Biochemistry

CHEM 4892 Capstone for Chemistry

Electives to bring total to 124

Elective Chemistry (3000/4000 level) 6

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.

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

Dept & School: **Computer Science and Engineering and Physics**
 College: **Mathematics and Science**
 Major Code: **6280**

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis 3

• Social and Behavioral Analysis..... 3

Life Skills 5

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

**Minimum
Required Hours**

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

- PHIL 1123 Contemporary Moral Problems
- ECON 1103 Introduction to Economics
- FMKT 2323 Global Protocol and Diversity
(or Second Language)
- *MATH 1533 Precalculus-Algebra **OR**
- MATH 1513 College Algebra **OR** Placement Score **AND**
- *MATH 1593 Plane Trigonometry **OR** Placement Score

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

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

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

Major Requirements

Computer Engineering 93

Physics..... 8

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

Engineering..... 34

- Required courses:
- ENGR 1112 Introduction to Engineering and Laboratory
 - ENGR 1213 Engineering Computing and Laboratory
 - ENGR 2303 Electrical Science
 - ENGR 2311 Electrical Science Laboratory
 - ENGR 3223 Digital Logic Design and Laboratory
 - ENGR 3303 Engineering Probability & Statistics
 - #ENGR 3323 Signals and Systems
 - ENGR 3331 Signals and Systems Laboratory
 - ENGR 3403 Analog Electronics
 - ENGR 3421 Analog Electronics Laboratory
 - ENGR 3613 Microprocessors and Laboratory
 - #ENGR 4333 Digital Signal Processing

**Minimum
Required Hours**

- ENGR 4351 Digital Signal Processing Laboratory
- #ENGR 4842 CE Senior Engineering Design I
- #ENGR 4892 Senior Engineering Design II

Computer Science 27

- Required courses:
- CMSC 1613 Programming in C++
 - CMSC 1621 Laboratory for Programming in C++
 - CMSC 2123 Discrete Structures
 - CMSC 2613 Fundamental Data Structures
 - CMSC 2621 Laboratory for Fundamental Data Structures
 - CMSC 2833 Computer Organization and Architecture I
 - SE 3103 Object-Oriented Design and Patterns
 - CMSC 3613 Algorithms and Advanced Data Structures
 - CMSC 3621 Laboratory for Algorithms and Advanced Data Structures
 - CMSC 3833 Computer Organization and Architecture II
 - CMSC 4133 Concepts of Artificial Intelligence

Mathematics 15

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

Choose one Concentration 9

Control Systems Concentration (Choose 9 hours from the following)

- CMSC 4193 Introduction to Robotics
- CMSC 4303 Mobile Application Programming
- #ENGR 4803 Mechatronics & Lab
- #ENGR 4303 Control Systems
- #ENGR 4403 Advanced Control Systems Design & Lab

Cybersecurity Engineering Concentration (Take these 9 hours)

- CMSC 4083 Cybersecurity
- #ENGR 4323 Digital and Analog Communications
- #ENGR 4253 Cybersecurity for Internet of Things Devices & Lab

Internet of Things Concentration (Take these 6 hours)

- CMSC 4313 Internet of Things
- #ENGR 4243 Internet of Things Systems & Lab

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

Dept & School: Computer Science and Engineering and Physics
 College: Mathematics and Science
 Major Code: 6280

**Minimum
Required Hours**

(Choose 3 additional hours from the following)

- CMSC 4303 Mobile Application Programming
- CMSC 4373 Cloud Web Apps Development
- #ENGR 4803 Mechatronics & Lab

into upper division unless they secure formal approval from the School of Engineering and Physics.

Admission to Engineering and Physics Upper Division is required to enroll in these courses.

Electives to bring total to..... 126*

* 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.

Admission into Engineering and Physics Upper Division

Students seeking the B.S. in Computer Engineering are required to make formal application to the Chairperson of the School of Engineering and Physics for admission into the upper division of this major. Applications must be submitted to the School of Engineering and Physics on or before the last Monday of January for Fall admission and the last Monday of August for Spring admission.

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:

- CMSC 1613 Programming I
- CMSC 1621 Programming I Lab
- CMSC 2613 Programming II
- CMSC 2621 Programming II Lab
- CMSC 2833 Computer Organization and Architecture I
- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- 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 2303 Electrical Science
- ENGR 2311 Electrical Science Lab

Formal approval by the school Faculty Advisor and School Chair is required for admission. The student may enroll in no more than nine (9) hours of 3000 and 4000 level courses in the major prior to admission

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)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....0-9

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

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

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

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

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

Major Requirements

Computer Science80-81

Required..... 61

- ^ CMSC 1613 Programming in C++
- ^ CMSC 1621 Laboratory for Programming in C++
- ^ CMSC 2123 Discrete Structures
- ^ CMSC 2613 Fundamental Data Structures
- ^ CMSC 2621 Laboratory for Fundamental Data Structures
- ^ CMSC 2833 Computer Organization and Architecture I
- ^ SE 3103 Object-Oriented Design and Patterns
- ^ CMSC 3613 Algorithms and Advanced Data Structures
- ^ CMSC 3621 Lab for Algorithms and Advanced Data Structures
- ^ CMSC 3833 Computer Organization and Architecture II
- ^ CMSC 4003 Applications of Database Management Systems
- ^ CMSC 4023 Programming Languages **OR**
- ^CMSC 4173 Translator Design
- ^ CMSC 4083 Cybersecurity
- ^ 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
- ^ MATH 2333 Calculus 3
- ^ MATH 3143 Linear Algebra
- ^ STAT 2113 Statistical Methods **OR**
- ^ STAT 2103 Introduction to Statistics for Sciences **OR**
- ^ STAT 4113 Mathematical Statistics I

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

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

Elective Science Courses..... 4-5

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

Elective CMSC or SE courses 15

- Any 3/4000 level CMSC or SE courses
- 6 hours of CMSC or SE electives may be taken at the 2000 level

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

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

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

Electives to bring total to..... 124

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

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

**Minimum
Required Hours**

- CONTINUED FROM PREVIOUS PAGE -

Minimum Grade Requirements

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

Accelerated BS/PSM

UCO's P.S.M. (Professional Science Master's) in Computational Science has partnered with the B.S. in Computer Science - Computer Science major so that approved students may take up to nine credit hours of 5000-level CMSC courses during their senior year of the major. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the Department of Computer Science are required. Requirements for the P.S.M. program are located in the UCO Graduate Catalog under Computational Science - Computer Science, P.S.M.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Computer Science - Computer Science and the P.S.M. Computational Science - Computer Science:

- CMSC 5043 Applications Database Systems
- CMSC 5283 Software Engineering I (replaces SE 4283)
- CMSC 5323 Computer and Network Security

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)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

**Minimum
Required Hours**

Support Courses
Major Support Courses 0-9

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

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

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

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

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

Major Requirements

Computer Science - Applied..... 61

Required..... 49

- ^ CMSC 1613 Programming in C++
- ^ CMSC 1621 Laboratory for Programming in C++
- ^ CMSC 2123 Discrete Structures
- ^ CMSC 2413 Visual Programming
- ^ CMSC 2613 Fundamental Data Structures
- ^ CMSC 2621 Laboratory for Fundamental Data Structures
- ^ CMSC 2833 Computer Organization and Architecture I
- ^ SE 3103 Object-Oriented Design and Patterns
- ^ CMSC 3303 Systems Analysis and Design **OR**
- ^ SE 4283 Software Engineering I
- ^ CMSC 3613 Algorithms and Advanced Data Structures
- ^ CMSC 3621 Lab for Algorithms and Advanced Data Structures
- ^ CMSC 4003 Applications of Database Management Systems
- ^ CMSC 4023 Programming Languages **OR**
- ^CMSC 4173 Translator Design
- ^ CMSC 4153 Operating Systems
- ^ CMSC 4401 Ethics in Computing
- ^*CMSC 4513 Software Design and Development

**Minimum
Required Hours**

- ^ MATH 2313 Calculus 1
- ^ MATH 2323 Calculus 2
- ^ STAT 2113 Statistical Methods **OR**
- ^ STAT 2103 Introduction to Statistics for Sciences **OR**
- ^ STAT 4113 Mathematical Statistics 1

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

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

Elective CMSC or SE courses 12

Any 3/4000 level CMSC or SE courses except SE 4513

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

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

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 certificate or comparable concentration in an information technology or non-computer science/non-general studies discipline from a regionally accredited two- or four-year college or international equivalent with the approval of the Computer Science Department.

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

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

**Minimum
Required Hours**

- CONTINUED FROM PREVIOUS PAGE -

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

Electives to bring total to..... 124

Minimum Grade Requirements

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

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Major Support Courses 0-12

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

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

CMSC 1053 Professional Computer Applications and Problem Solving

Advanced Placement High School Programming Course **OR**

CMSC 1513 Beginning Programming

*MATH 1533 Precalculus-Algebra **OR**

MATH 1513 College Algebra **OR** Placement Score **AND**

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

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

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

Major Requirements

Computer Science - Information Science..... 79

Required..... 67

- ^ CMSC 1613 Programming in C++
- ^ CMSC 1621 Laboratory for Programming in C++
- ^ CMSC 2123 Discrete Structures
- ^ CMSC 2413 Visual Programming
- ^ CMSC 2613 Fundamental Data Structures
- ^ CMSC 2621 Laboratory for Fundamental Data Structure
- ^ CMSC 2833 Computer Organization and Architecture I
- ^ SE 3103 Object-Oriented Design and Patterns
- ^ CMSC 3303 Systems Analysis and Design **OR**
- SE 4283 Software Engineering I
- ^ CMSC 3413 Enterprise Programming
- ^ CMSC 3613 Algorithms and Advanced Data Structures
- ^ CMSC 3621 Lab for Algorithms and Advanced Data Structures

- ^ CMSC 4003 Applications of Database Management Systems
- ^ CMSC 4063 Computer Networks
- ^ CMSC 4083 Cybersecurity
- ^ CMSC 4153 Operating Systems
- ^ CMSC 4401 Ethics in Computing
- ^* CMSC 4513 Software Design and Development
- ^ MATH 2313 Calculus 1
- ^ MATH 2323 Calculus 2
- ^ STAT 2113 Statistical Methods **OR**
- ^ STAT 2103 Introduction to Statistics for Sciences **OR**
- ^ STAT 4113 Mathematical Statistics I
- ACCT 2113 Accounting I
- ACCT 2133 Accounting II
- MGMT 3103 Principles of Management
- ISOM 3263 Management Information Systems

^ 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 6

Any 3/4000 level CMSC or SE courses except SE 4513

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

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

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 Emerging Topics in Information Systems

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

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

**Minimum
Required Hours**

- CONTINUED FROM PREVIOUS PAGE -

Electives to bring total to..... 124

Minimum Grade Requirements

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

Accelerated BS/PSM

UCO's P.S.M. (Professional Science Master's) in Computational Science has partnered with the B.S. in Computer Science - Information Science major so that approved students may take up to nine credit hours of 5000-level CMSC courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the Department of Computer Science are required. Requirements for the P.S.M. program are located in the UCO Graduate Catalog under Computational Science - Computer Science, P.S.M.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Computer Science - Information Science and the P.S.M. Computational Science - Computer Science:

- CMSC 5043 Applications Database Systems
- CMSC 5283 Software Engineering I
- CMSC 5323 Computer and Network Security

Program: Data Science	Dept: Mathematics & Statistics and Computer Science
Major: Data Science	College: Mathematics and Science
Degree: Bachelor of Science (B.S.)	Major Code: 6190

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

• Social and Behavioral Analysis..... 3

Life Skills 5

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

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....0-9

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

Advanced Placement High School Programming Course **OR**

CMSC 1513 Beginning Programming

*MATH 1533 Precalculus-Algebra **OR**

MATH 1513 College Algebra **OR** Placement Score **AND**

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

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

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

Major Requirements

Data Science.....69

Required Courses..... 51

- CMSC 1613 Programming in C++
- CMSC 1621 Laboratory for Programming in C++
- ^ CMSC 2613 Fundamental Data Structures
- ^ CMSC 2621 Laboratory for Fundamental Data Structure
- CMSC 2123 Discrete Structures
- ^ CMSC 3613 Algorithms and Advanced Data Structures
- ^ CMSC 3621 Lab for Algorithms and Advanced Data Structures
- CMSC 4003 Applications of Database Management Systems
- CMSC 4143 Algorithms for Machine Learning
- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 3143 Linear Algebra
- STAT 2113 Statistical Methods
- STAT 3213 Fundamentals of Data Science
- STAT 4413 Data Visualization and Exploration
- STAT 4213 Applied Regression Analysis

Upper Division Electives..... 18

Computer Science or Software Engineering..... 6
Any combination of 3000-4000 level CMSC or SE courses except CMSC 4513 or SE 4513

Statistics 6

Any combination of 3000-4000 level STAT courses

Computer Science, Software Engineering, Mathematics, or Statistics 6

Any combination of 3000-4000 level courses from either CMSC, SE, MATH, or STAT except CMSC 4513 or SE 4513

Electives to bring total to..... 124

Minimum Grade Requirements

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

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

Dept: Mathematics & Statistics and Computer Science
 College: Mathematics and Science
 Major Code: 6190

- CONTINUED FROM PREVIOUS PAGE -

Accelerated BS/PSM

UCO's PSM (Professional Science Master's) in Computational Science has partnered with the B.S. in Data Science so that approved students may take up to nine credit hours of 5000-level CMSC, MATH, or STAT courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the Department of Mathematics and Statistics (for students pursuing the P.S.M. Computational Science - Computational Mathematics) or the Department of Computer Science (for students pursuing the Computational Science - Computer Science) are required. Requirements are located in the UCO Graduate Catalog under Computational Science - Computer Science, P.S.M. and Computational Science - Computational Mathematics, P.S.M.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Data Science and the P.S.M. Computational Science - Computational Mathematics:

CMSC	5043	Applications Database Systems
CMSC	5143	Algorithms for Machine Learning
STAT	5213	Applied Regression Analysis
STAT	5533	Data Mining and Statistical Learning
STAT	5413	Data Visualization and Exploration

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Data Science and the P.S.M. Computational Science - Computer Science:

CMSC	5043	Applications Database Systems
CMSC	5143	Algorithms for Machine Learning
STAT	5213	Applied Regression Analysis
STAT	5533	Data Mining and Statistical Learning

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

School: **Engineering and Physics**
 College: **Mathematics and Sciences**
 Major Code: **6260**

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

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

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

• Social and Behavioral Analysis..... 3

Life Skills 5

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

**Minimum
Required Hours**

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

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

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

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

Major Requirements

Electrical Engineering92-97

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

**Minimum
Required Hours**

- 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 4872 EE 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..... 5-10

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

Guided Engineering Electives..... 3

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

Admission into Engineering and Physics Upper Division is required.

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

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

- 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.**

Admission into Engineering and Physics Upper Division

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

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

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

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

Formal approval by the school Faculty Advisor and School 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 School of Engineering and Physics.

Accelerated BS/MS

The School of Engineering and Physics offers a M.S. Engineering Physics - Electrical Engineering major. Students in the B.S. Electrical Engineering program are eligible to pursue, with approval, the M.S. Engineering Physics - Electrical Engineering degree beginning in their senior year. Approved B.S. Electrical Engineering students may take up to 10 credit hours of 5000-level ENGR courses during their senior year of the B.S. program. These courses will count toward both the B.S. and M.S. degrees. A formal application to the M.S. Engineering Physics program and an approval from the School of Engineering and Physics are required. Requirements are located in the UCO Graduate Catalog under Engineering Physics - Electrical Engineering.

Up to 10 credit hours of the following courses can be used to satisfy both the B.S. Electrical Engineering and the M.S. Engineering Physics - Electrical Engineering programs:

ENGR	5323	Digital and Analog Communication
ENGR	5333	Digital Signal Processing
ENGR	5311	Digital Signal Processing Laboratory
ENGR	5803	Mechatronics & Laboratory
ENGR	5083	Electromagnetic Fields II
ENGR	5613	Photonics
ENGR	5633	Solid State Devices

Accelerated BS/PSM

UCO’s PSM (Professional Science Master’s) in Computational Science has partnered with the B.S. in Electrical Engineering so that approved students may take up to 10 credit hours of 5000-level ENGR courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the School of Engineering and Physics are required. Requirements are located in the UCO Graduate Catalog under Computational Science - Computational Engineering, P.S.M.

Up to 10 credit hours of the following courses can be used to satisfy both the B.S. Electrical Engineering and the P.S.M. Computational Science - Computational Engineering:

ENGR	5023	Heat Transfer
ENGR	5103	Finite Element Analysis
ENGR	5333	Digital Signal Processing
ENGR	5311	Digital Signal Processing Laboratory
ENGR	5803	Mechatronics & Laboratory
BME	5223	Biomedical Imaging

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

• Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis 3

• Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills 3

**Minimum
Required Hours**

Support Courses

Support Courses 9-18

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

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

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

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

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

Major Requirements

Engineering Physics - Physics 91-96

Physics 23

- Required courses 17
- PHY 2014 Physics for Science and Engineering I and Lab
- PHY 2114 Physics for Science and Engineering II and Lab
- PHY 3103 Modern Physics
- PHY 3883 Mathematical Physics I
- PHY 4203 Quantum Mechanics

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

Physics Elective 3
 3000-level or 4000-level PHY course

Engineering 48

- Required courses 45
- ENGR 1112 Introduction to Engineering and Laboratory
- ENGR 1213 Engineering Computing and Laboratory
- ENGR 2033 Statics
- ENGR 2043 Dynamics

**Minimum
Required Hours**

- ENGR 2203 Thermodynamics
- ENGR 2303 Electrical Science
- ENGR 2311 Electrical Science Laboratory
- #ENGR 3183 Electromagnetic Fields I
- 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 4852 EP 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

Admission into Engineering and Physics Upper Division is required.

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

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

- CONTINUED FROM PREVIOUS PAGE -

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

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

Minimum Grade Requirements

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

Admission into Engineering and Physics Upper Division

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

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

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

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

Formal approval by the school Faculty Advisor and School 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 School of Engineering and Physics.

Accelerated BS/MS

The School of Engineering and Physics offers a M.S. Engineering Physics - Physics major. Students in the B.S. Engineering Physics program are eligible to pursue, with approval, the M.S. Engineering Physics - Physics degree beginning in their senior year. Approved B.S. Engineering Physics students may take up to nine credit hours of 5000-level ENGR courses during their senior year of the B.S. program. These courses will count toward both the B.S. and M.S. degrees. A formal application to the M.S. Engineering Physics program and an approval from the School of Engineering and Physics are required. Requirements are located in the UCO Graduate Catalog under Engineering Physics - Physics.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Engineering Physics and the M.S. Engineering Physics - Physics programs:

PHY	5443	Quantum Mechanics
A 5000-level PHY, ENGR, or BME course		
A 5000-level PHY course		

Accelerated BS/PSM

UCO’s PSM (Professional Science Master’s) in Computational Science has partnered with the B.S. in Engineering Physics so that approved students may take up to 10 credit hours of 5000-level ENGR courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the School of Engineering and Physics are required. Requirements are located in the UCO Graduate Catalog under Computational Science - Computational Engineering, P.S.M.

Up to 10 credit hours of the following courses can be used to satisfy both the B.S. Engineering Physics and the P.S.M. Computational Science - Computational Engineering:

ENGR	5023	Heat Transfer
ENGR	5103	Finite Element Analysis
ENGR	5333	Digital Signal Processing
ENGR	5311	Digital Signal Processing Laboratory
ENGR	5803	Mechatronics & Laboratory
ENGR	5443	Fluid Dynamics
PHY	5443	Quantum Mechanics

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

Math 3

Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2

• Elective Life Skills 3

**Minimum
Required Hours**

Major Requirements

Funeral Service..... 67

Required Course 2

* FNRL 4522 Board Review

Basic Sciences 15

Required courses:

BIO 2314 Introduction to Microbiology and Lab

CHEM 1014 Introduction to Chemistry and Lab

FNRL 2214 Introduction to Human Anatomy and Dissection

FNRL 3433 Introduction to Pathology

Mortuary Arts and Sciences..... 20

Required courses:

FNRL 3054 Embalming Chemistry

FNRL 3204 Embalming

FNRL 3304 Restorative Art

* FNRL 4118 Practicum in Embalming & Funeral Directing

Mortuary Administration..... 30

Required courses:

FNRL 1211 Orientation to Funeral Service

FNRL 2313 Contemporary Funeral Service

FNRL 2413 Funeral Home Administration

FNRL 3374 Funeral Home Management I

FNRL 3383 Funeral Service Statutory Law

FNRL 3393 Mortuary Jurisprudence

FNRL 3493 Funeral Service Communication

FNRL 3513 History of Funeral Directing

FNRL 4214 Funeral Home Management II

FNRL 3483 Psychology of Grief

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

Electives to bring total to 124

Minimum Grade Requirements

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

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

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

The Department of Funeral Service Bachelor of Science Degree and Certificate of Completion Programs at the University of Central Oklahoma are accredited by the American Board of Funeral Service Education (ABFSE) 992 Mantua Pike, Suite 108, Woodbury Heights, NJ 08097 (816)233-3747 www.abfse.org.

Student Learning Outcomes

Upon completion of the accredited Bachelor’s Degree and Certificate program, students will be able to:

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

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

**Minimum
Required Hours**

Prerequisite Courses

Prerequisite Courses 0-6

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

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

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

Major Requirements

Mathematics 47

Required..... 30

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

Electives 17

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

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

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

Electives to bring total to..... 124

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

Minimum Grade Requirements

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

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

Accelerated BS/MS

The Department of Mathematics and Statistics offers a M.S. program in Applied Mathematical Science. Students in the B.S. Mathematics program are eligible to pursue, with approval, an M.S. Applied Mathematical Science degree beginning in their senior year. Approved B.S. students may take up to nine credit hours of 5000-level MATH or STAT courses during their senior year of the B.S. program. These courses will count toward both the B.S. and M.S. degrees. A formal application to the M.S. Applied Mathematical Science program and an approval from the Department of Mathematics and Statistics are required. Requirements are located in the UCO Graduate Catalog under Applied Mathematical Science - Mathematics, Applied Mathematical Science - Statistics, or Applied Mathematical Science - Teaching.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Mathematics and the M.S. Applied Mathematical Science programs:

- MATH 5113 Operations Research 1
- MATH 5123 Operations Research 2
- MATH 5263 Numerical Linear Algebra
- MATH 5373 Applied Numerical Analysis
- MATH 5453 Mathematical Modeling

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

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

- CONTINUED FROM PREVIOUS PAGE -

MATH 5910 Seminar/Special Topics*
 STAT 5103 Applied Experimental Design
 STAT 5123 Mathematical Statistics 2
 STAT 5213 Applied Regression Analysis
 STAT 5263 Computer Applications in Statistics

*Students are restricted to one (1) cross-listed 5910 course while classified as an ADP student.

Accelerated BS/PSM

UCO's P.S.M. (Professional Science Master's) in Computational Science has partnered with the B.S. in Mathematics so that approved students may take up to nine credit hours of 5000-level MATH or STAT courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the Department of Mathematics and Statistics are required. Requirements are located in the UCO Graduate Catalog under Computational Science - Computational Mathematics, P.S.M.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Mathematics and the P.S.M. Computational Science - Computational Mathematics :

MATH	5113	Operations Research I
MATH	5263	Numerical Linear Algebra
MATH	5373	Applied Numerical Analysis
STAT	5263	Computer Applications in Statistics
STAT	5213	Applied Regression Analysis

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

Life Science 4

Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

Critical Inquiry..... 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis..... 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course..... 2

Elective Life Skills..... 3

Minimum Required Hours

Prerequisite Courses

Prerequisite Courses 0-6

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

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

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

Major Requirements

Mathematics - Applied Mathematics 48

Required courses 27

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

Applied Mathematics..... 21

Required courses:

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

Electives to bring total to..... 124

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

Minimum Grade Requirements

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

Accelerated BS/MS

The Department of Mathematics and Statistics offers a M.S. program in Applied Mathematical Science. Students in the B.S. Mathematics - Applied Mathematics program are eligible to pursue, with approval, an M.S. Applied Mathematical Science degree beginning in their senior year. Approved B.S. students may take up to nine credit hours of 5000-level MATH or STAT courses during their senior year of the B.S. program. These courses will count toward both the B.S. and M.S. degrees. A formal application to the M.S. Applied Mathematical Science program and an approval from the Department of Mathematics and Statistics are required. Requirements are located in the UCO Graduate Catalog under Applied Mathematical Science - Mathematics, Applied Mathematical Science - Statistics, or Applied Mathematical Science - Teaching.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Mathematics - Applied Mathematics and the M.S. Applied Mathematical Science programs:

- MATH 5113 Operations Research I
- MATH 5123 Operations Research II
- MATH 5263 Numerical Linear Algebra
- MATH 5373 Applied Numerical Analysis

- CONTINUED ON NEXT PAGE -

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

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

- CONTINUED FROM PREVIOUS PAGE -

MATH 5453 Mathematical Modeling
 MATH 5910 Seminar/Special Topics*
 STAT 5213 Applied Regression Analysis
 STAT 5263 Computer Applications in Statistics

*Students are restricted to one (1) cross-listed 5910 course while classified as an ADP student.

Accelerated BS/PSM

UCO's P.S.M. (Professional Science Master's) in Computational Science has partnered with the B.S. in Mathematics - Applied Mathematics so that approved students may take up to nine credit hours of 5000-level MATH or STAT courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the Department of Mathematics and Statistics are required. Requirements are located in the UCO Graduate Catalog under Computational Science - Computational Mathematics, P.S.M.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Mathematics and the P.S.M. Computational Science - Computational Mathematics :

MATH	5113	Operations Research I
MATH	5263	Numerical Linear Algebra
MATH	5373	Applied Numerical Analysis
STAT	5263	Computer Applications in Statistics
STAT	5213	Applied Regression Analysis

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

**Minimum
Required Hours**

**Prerequisite Courses
Prerequisite Courses 0-6**

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

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

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

Major Requirements

Mathematics - Statistics..... 54

Mathematics 27

- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 2753 Technology for Professional Math and Statistics
- MATH 3103 Differential Equations
- MATH 3113 Foundations of Advanced Math
- MATH 3143 Linear Algebra
- MATH 3183 Introduction to Modern Algebra **OR**
- MATH 4143 Introduction to Analysis 1

Statistics 27

- Required Courses..... 18
- STAT 2113 Statistical Methods
- STAT 4103 Applied Experimental Design
- STAT 4113 Mathematical Statistics 1
- STAT 4123 Mathematical Statistics 2
- STAT 4213 Applied Regression Analysis
- STAT 4513 Statistical Consulting

Electives..... 9

Selected from the following:

- STAT 3213 Fundamentals of Data Science
- STAT 4253 Computer Applications in Statistics

**Minimum
Required Hours**

- STAT 4313 Nonparametric Statistics
- STAT 4533 Data Mining and Statistical Learning
- STAT 4413 Data Visualization and Exploration

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.**

Accelerated BS/MS

The Department of Mathematics and Statistics offers a M.S. program in Applied Mathematical Science. Students in the B.S. Mathematics - Statistics program are eligible to pursue, with approval, an M.S. Applied Mathematical Science degree beginning in their senior year. Approved B.S. students may take up to nine credit hours of 5000-level MATH or STAT courses during their senior year of the B.S. program. These courses will count toward both the B.S. and M.S. degrees. A formal application to the M.S. Applied Mathematical Science program and an approval from the Department of Mathematics and Statistics are required. Requirements are located in the UCO Graduate Catalog under Applied Mathematical Science - Mathematics, Applied Mathematical Science - Statistics, or Applied Mathematical Science - Teaching.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Mathematics - Statistics and the M.S. Applied Mathematical Science programs:

- MATH 5113 Operations Research 1
- MATH 5910 Seminar/Special Topics*
- STAT 5103 Applied Experimental Design
- STAT 5123 Mathematical Statistics 2
- STAT 5213 Applied Regression Analysis
- STAT 5263 Computer Applications in Statistics

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

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

- CONTINUED FROM PREVIOUS PAGE -

STAT 5303 Nonparametric Statistics
 STAT 5413 Data Visualization
 STAT 5533 Data Mining & Statistical Learning
 STAT 5910 Seminar/Special Topics*

*Students are restricted to one (1) cross-listed 5910 course while classified as an ADP student.

Accelerated BS/PSM

UCO's P.S.M. (Professional Science Master's) in Computational Science has partnered with the B.S. in Statistics so that approved students may take up to nine credit hours of 5000-level MATH or STAT courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the Department of Mathematics and Statistics are required. Requirements are located in the UCO Graduate Catalog under Computational Science - Computational Mathematics, P.S.M.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Statistics and the P.S.M. Computational Science - Computational Mathematics :

MATH	5113	Operations Research I
MATH	5263	Numerical Linear Algebra
MATH	5373	Applied Numerical Analysis
STAT	5263	Computer Applications in Statistics
STAT	5213	Applied Regression Analysis

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

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

University Core (Total Listed 42-44)

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

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

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

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis..... 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis..... 3

Life Skills 5

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

Minimum
Required Hours

Minimum
Required Hours

Support and Prerequisite Courses

Support Courses.....9

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

Prerequisite Courses0-6

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

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

Major Requirements

Mathematics Education.....41-42

Required courses 36

- MATH 2123 Survey of Discrete for Math Education
- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- MATH 2743 Technology and Mathematics Education
- MATH 3113 Foundations of Advanced Mathematics
- MATH 3123 College Geometry
- MATH 3143 Linear Algebra
- MATH 3163 Elementary Number Theory **OR**
- MATH 3183 Introduction to Modern Algebra
- MATH 4483 History of Mathematics
- STAT 2113 Statistical Methods

Mathematics Electives 5-6

Select at least two of the following:

- MATH 2023 Foundations of Geometry and Measurement
- MATH 3103 Differential Equations
- MATH 3163 Elementary Number Theory
- MATH 3183 Introduction to Modern Algebra
- MATH 4143 Introduction to Analysis 1
- MATH 4960 Institute in Mathematics (2 hours)
- STAT 4113 Mathematical Statistics 1

Professional Education 32

- PTE 1010 Introduction to Teacher Education
- PTE 3023 Foundations of American Education/Clinical Exp
- PTE 3153 Adolescent Psychology
- SPED 4123 Teaching Individuals with Disabilities
- MATH 3323 Teaching Middle School Math
- ^MATH 4843 Teaching Secondary Mathematics
- ^PTE 4172 Educational Assessment
- ^PTE 4533 Contemporary Learning Sciences
- ^#PTE 4811 Contemporary Issues
- ^#PTE 4838 Internship/Student Teaching Secondary
- ^#PTE 4853 Classroom Management & Instruction

^ Admission to Teacher Education required

#To be taken the same semester

Electives to bring total to..... 124

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

Minimum Graduation Requirements

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

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

School: **Engineering and Physics**
 College: **Mathematics and Science**
 Major Code: **6270**

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

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

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

• Social and Behavioral Analysis..... 3

Life Skills 5

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

**Minimum
Required Hours**

Support Courses 9-18

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

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

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

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

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

Major Requirements

Mechanical Engineering 94-99

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 2203 Thermodynamics
 - ENGR 2303 Electrical Science
 - ENGR 2311 Electrical Science Laboratory
 - ENGR 3211 Thermal Engineering Laboratory
 - ENGR 3303 Engineering Probability and Statistics

**Minimum
Required Hours**

- #ENGR 3323 Signals and Systems
- ENGR 3331 Signals and Systems Laboratory
- #ENGR 3363 Mechanical Engineering Design
- #ENGR 3413 Materials Science
- #ENGR 3443 Fluid Mechanics
- #ENGR 3451 Fluid Mechanics Lab
- ENGR 3703 Computational Methods in Engineering
- #ENGR 4123 Heat Transfer
- #ENGR 4141 Heat Transfer Lab
- #ENGR 4533 Thermal Systems Design
- #ENGR 4803 Mechatronics & Laboratory
- #ENGR 4862 ME 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 5-10

- 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

Guided Physics or Engineering Electives..... 6

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

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

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

- CONTINUED FROM PREVIOUS PAGE -

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

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

Admission into Engineering and Physics Upper Division is required.

Formal approval by the school Faculty Advisor and School 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 School of Engineering and Physics.

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.

Accelerated BS/MS

The School of Engineering and Physics offers a M.S. Engineering Physics - Mechanical Engineering major. Students in the B.S. Mechanical Engineering program are eligible to pursue, with approval, the M.S. Engineering Physics - Mechanical Engineering degree beginning in their senior year. Approved B.S. Mechanical Engineering students may take up to nine credit hours of 5000-level ENGR courses during their senior year of the B.S. program. These courses will count toward both the B.S. and M.S. degrees. A formal application to the M.S. Engineering Physics program and an approval from the School of Engineering and Physics are required. Requirements are located in the UCO Graduate Catalog under Engineering Physics - Mechanical Engineering.

Admission into Engineering and Physics Upper Division

Students seeking the B.S. in Biomedical Engineering, Electrical Engineering, Engineering Physics – Physics and Mechanical Engineering are required to make formal application to the Chairperson of the School of Engineering and Physics for admission into the upper division of each of these majors. Applications must be submitted to the School 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

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Mechanical Engineering and the M.S. Engineering Physics - Mechanical Engineering programs:

ENGR 5023 Heat Transfer
 ENGR 5533 Thermal Systems Design
 ENGR 5803 Mechatronics & Laboratory

Accelerated BS/PSM

UCO's PSM (Professional Science Master's) in Computational Science has partnered with the B.S. in Mechanical Engineering so that approved students may take up to 10 credit hours of 5000-level ENGR courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the School of Engineering and Physics are required. Requirements are located in the UCO Graduate Catalog under Computational Science - Computational Engineering, P.S.M.

Up to 10 credit hours of the following courses can be used to satisfy both the B.S. Mechanical Engineering and the P.S.M. Computational Science - Computational Engineering:

ENGR 5023 Heat Transfer
 ENGR 5103 Finite Element Analysis
 ENGR 5333 Digital Signal Processing
 ENGR 5311 Digital Signal Processing Laboratory
 ENGR 5803 Mechatronics & Laboratory
 BME 5223 Biomedical Imaging

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

Math 3

• Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

• Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

• Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2

• Elective Life Skills 3

**Minimum
Required Hours**

Major Requirements

Nursing 97-98

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

Pre-Professional 38-39

The following courses:

- CHEM 1014 Introductory Chemistry and Lab
- BIO 1114 General Biology **OR**
- BIO 1204 Biology for Majors: Principles
- NTRN 1513 Introduction to Nutrition
- PSY 1103 General Psychology
- SOC 2103 Sociology
- BIO 2314 Introductory Microbiology and Lab
- BIO 2504 Human Anatomy and Lab **OR**
- FNRL 2214 Elementary Human Anatomy and Dissection
- BIO 2604 Human Physiology and Lab
- ECON 2173 Principles of Business Statistics **OR**
- PSY 2753 Psychological Statistics **OR**
- SOC 4043 Sociological Statistics **OR**
- STAT 2113 Statistical Methods **OR**
- ECON 2303 Statistics for Healthcare **OR**
- STAT 2103 Introduction to Statistics for Sciences
- PHIL 1103 Logic and Critical Thinking **OR**
- PHIL 1073 Social & Political Philosophy **OR**
- PHIL 1113 Introduction to Philosophy **OR**
- PHIL 1123 Contemporary Moral Problems
- +NURS 1221 Introduction to Nursing
- NURS 2113 Individual and Family Development Through the Lifespan

Traditional Track

Professional 59

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

**Minimum
Required Hours**

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

RN to BS Track 56-59

Up to 35 credit hours of advanced standing credit may be awarded for courses marked with +.

Professional: (24 credit hours)

- NURS 4613 Role Development
- NURS 4443 Civic Engagement in Health
- NURS 4153 Nursing Research/Evidence-Based Practice
- NURS 4363 Community & Systems Health
- NURS 4343 Alterations in Health
- NURS 4623 Advanced Clinical Response
- NURS 4463 Leadership for Career Advancement
- NURS 4873 Capstone for Career Advancement

Electives to bring total to 124*

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

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

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

- CONTINUED FROM PREVIOUS PAGE -

Minimum Grade Requirements

1. Average in (a) all college course work, and (b) course work at UCO 2.00
2. A minimum grade of "C" must be earned in all CHEM, BIO, and NURS prefix courses.

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 as indicated on the nursing department website.

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

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

- A. Transcript(s) reflecting a minimum retentive grade point average of 2.50 in all course work completed at the time of the application.
- B. A minimum grade of "C" in chemistry, all biological sciences, NURS 1221 and NURS 2113 is required. Two of the five required science courses must be successfully completed prior to the application deadline. Human Anatomy must be successfully completed before starting NURS 2207 Foundations of Nursing. Students may enroll a maximum of two times in any nursing course.
- C. Score on the Standardized Admission Assessment Exam. This test may only be taken one time per application period.
- 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 6.5 on the IELTS.

Fast Track - BS

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

Career Ladder Students RN to BS

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

Accelerated RN-MS

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

Transfer Students

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

Progression in the Program

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

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

Other Requirements

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

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

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

University Core (Total Listed 42-44)

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

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

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

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

• Life Science 4

• Physical Science 3-4

Critical Inquiry and Aesthetic Analysis 6

Aesthetic Analysis 3

Critical Inquiry 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language 4

OR

Cultural Analysis 3

Social and Behavioral Analysis 3

Life Skills 5

Required Health Course 2

Elective Life Skills 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....9-15

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

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

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

- MATH 1453 Applied Algebra **OR**
- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry

Major Requirements

Science Education - Biology65

Biology..... 25

Required courses:

- BIO 1204 Biology for Majors: Principles
- BIO 1224 Biology for Majors: Diversity
- BIO 2203 Cell Biology
- BIO 2211 Cell Biology Laboratory
- BIO 3054 Microbiology for Majors and Lab
- BIO 3303 Genetics
- BIO 3543 General Ecology
- BIO 3703 Evolution

Chemistry..... 10

Required courses:

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

Physics..... 8

Required courses:

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

Mathematics 6

Required courses:

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

Elective 3000/4000 Biology 16

Any 3000/4000 level BIO course

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

- BIO 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 Education31

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

^ Admission to Teacher Education required

#To be taken the same semester

Minimum Hours required 128*

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

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

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

- CONTINUED FROM PREVIOUS PAGE -

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

Minimum Graduation Requirements

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

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

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

University Core (Total Listed 42-44)

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

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

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

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis..... 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis..... 3

Life Skills 5

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

**Minimum
Required Hours**

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 1453 Applied Algebra **OR**
- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry

Major Requirements

Science Education - Chemistry 65

Science Education Core 36

Biology 8

Required courses:

- BIO 1204 Biology for Majors: Principles
- BIO 1224 Biology for Majors: Diversity

Chemistry..... 10

Required courses:

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

Physics 8

Required courses:

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

Earth Science 4

- PHY 3014 Earth Science

Computer Science..... 3

- CMSC 1513 Beginning Programming

**Minimum
Required Hours**

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

Science Education - Chemistry 29

Required Courses..... 18

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

Elective Courses..... 11

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

Professional Education 31

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

^ Admission to Teacher Education required

#To be taken the same semester

Minimum Hours required 128*

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

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

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

- CONTINUED FROM PREVIOUS PAGE -

Minimum Graduation Requirements

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

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

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

University Core (Total Listed 42-44)

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

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

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

- American Historical and Political Analysis** 6
- American National Government 3
- American History 3
- Cultural and Language Analysis** 3-4
- Second Language 4
- OR
- Cultural Analysis..... 3
- Social and Behavioral Analysis**..... 3
- Life Skills** 5
- Required Health Course..... 2
- Elective Life Skills..... 3

**Minimum
Required Hours**

Support Courses

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

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

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

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

Major Requirements

Science Education - General Science.....**63**

Science Education Core..... **33**

- Biology 8
- Required courses:
- BIO 1204 Biology for Majors: Principles
- BIO 1224 Biology for Majors: Diversity
- Chemistry..... 10
- Required courses:
- CHEM 1103 General Chemistry I **AND**
- CHEM 1112 General Chemistry I Recitation/Lab
- CHEM 1223 General Chemistry II **AND**
- CHEM 1232 General Chemistry II Recitation/Lab
- Physics 8
- Required courses:
- PHY 1114 General Physics I and Lab **OR**
- PHY 2014 Physics for Science and Engineering I and Lab
- PHY 1214 General Physics II and Lab **OR**
- PHY 2114 Physics for Science and Engineering II and Lab

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

**Minimum
Required Hours**

- Earth Science 4
- Required course:
- PHY 3014 Earth Science
- Science Education - General Science**..... **30**
- Required courses:
- BIO 2203 Cell Biology
- BIO 2211 Cell Biology Laboratory
- BIO 3054 Microbiology for Majors and Lab
- BIO 3303 Genetics
- BIO 3543 General Ecology
- BIO 3703 Evolution
- CHEM 2104 Quantitative Analysis and Lab
- CHEM 3303 Organic Chemistry I **OR**
- CHEM 3013 Organic Chemistry for Life Sciences
- CHEM 3312 Organic Chemistry I Lab **OR**
- CHEM 3022 Organic Chemistry for Life Sciences Laboratory
- PHY 1304 Descriptive Astronomy

Professional Education **31**

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

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

- CONTINUED ON NEXT PAGE -

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

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

**Minimum
Required Hours**

- CONTINUED FROM PREVIOUS PAGE -

Minimum Hours required 126*

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

Minimum Graduation Requirements

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

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

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

University Core (Total Listed 42-44)

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

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

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

Quantitative Reasoning/Scientific Method 10-11

• Math..... 3

• Life Science..... 4

• Physical Science..... 3-4

Critical Inquiry and Aesthetic Analysis..... 6

Aesthetic Analysis..... 3

Critical Inquiry..... 3

American Historical and Political Analysis 6

American National Government 3

American History 3

Cultural and Language Analysis 3-4

Second Language..... 4

OR

Cultural Analysis..... 3

Social and Behavioral Analysis..... 3

Life Skills 5

Required Health Course..... 2

Elective Life Skills..... 3

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....9-15

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

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

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

- MATH 1453 Applied Algebra **OR**
- MATH 1513 College Algebra **AND**
- MATH 1593 Plane Trigonometry

Major Requirements

Science Education - Physical Science 65

Science Education Core 36

Biology 8

Required courses:

- BIO 1204 Biology for Majors: Principles
- BIO 1224 Biology for Majors: Diversity

Chemistry..... 10

Required courses:

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

* Physics 8

Required courses:

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

Earth Science 4

Required course:

- PHY 3014 Earth Science

Mathematics..... 3

Required course:

- STAT 2103 Introduction to Statistics for Sciences

Computer Science..... 3

Required course:

- CMSC 1513 Beginning Programming

Science Education - Physical Science 29

Required courses..... 20

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

Elective Science..... 9

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

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

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

**Minimum
Required Hours**

- CONTINUED FROM PREVIOUS PAGE -

- SPED 4123 Teaching Individuals with Disabilities
- ^BIO 4812 Teaching and Learning in Science Classrooms
- ^BIO 4853 General Methods of Teaching Science and Lab
- ^PTE 4172 Educational Assessment
- ^PTE 4533 Contemporary Learning Sciences
- ^#PTE 4811 Contemporary Issues
- ^#PTE 4838 Internship/Student Teaching Secondary
- ^#PTE 4853 Classroom Management & Instruction

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

Minimum Hours required 128*

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

Minimum Graduation Requirements

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

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

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

University Core (Total Listed 42-44)

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

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

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

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis..... 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis..... 3

Life Skills 5

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

**Minimum
Required Hours**

Support Courses 9-15

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

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

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

Major Requirements

Science Education - Physics 61

Science Education Core 33

Biology 8

Required courses:

- BIO 1204 Biology for Majors: Principles
- BIO 1224 Biology for Majors: Diversity

Chemistry..... 10

Required courses:

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

Physics 8

Required courses:

- PHY 2014 Physics for Science and Engineering I and Lab
- PHY 2114 Physics for Science and Engineering II and Lab

Earth Science 4

Required course:

- PHY 3014 Earth Science

Computer Science..... 3

Required course:

- CMSC 1513 Beginning Programming

**Minimum
Required Hours**

Science Education - Physics 28

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

^ Admission to Teacher Education required

#To be taken the same semester

Minimum Hours required 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, and two years of a second language in high school.

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

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

- CONTINUED FROM PREVIOUS PAGE -

Minimum Graduation Requirements

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

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)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

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

American Historical and Political Analysis 6

- American National Government 3
- American History 3

Cultural and Language Analysis 3-4

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

Social and Behavioral Analysis 3

Life Skills 5

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

**Minimum
Required Hours**

**Minimum
Required Hours**

Support Courses

Support Courses.....0-9

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

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

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

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

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

Major Requirements

Software Engineering78-81

Required..... 55

- ^CMSC 1613 Programming in C++
- ^CMSC 1621 Lab for Programming in C++
- ^CMSC 2123 Discrete Structures
- ^CMSC 2613 Fundamental Data Structures
- ^CMSC 2621 Fundamental Data Structures Lab
- ^CMSC 2833 Computer Organization and Architecture I
- ^SE 3103 Object Oriented Design and Patterns
- ^CMSC 3613 Algorithms & Advanced Data Structures
- ^CMSC 3621 Algorithms & Advanced Data Structures Lab
- ^CMSC 4003 Applications of Database Management Systems
- ^CMSC 4083 Cybersecurity
- ^SE 4283 Software Engineering I
- ^CMSC 4401 Ethics in Computing
- ^SE 4423 Software Engineering II
- ^SE 4433 Software Architecture and Design
- ^SE 4513 Software Engineering Senior Project *
- ^MATH 2313 Calculus 1
- ^MATH 2323 Calculus 2

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

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

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

Elective Science/Math courses 8-11

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

- CHEM 1103 General Chemistry I
 - CHEM 1112 General Chemistry I Recitation/Laboratory
 - CHEM 1223 General Chemistry II
 - CHEM 1232 General Chemistry II Recitation/Laboratory
 - PHY 1114 General Physics I and Laboratory
 - PHY 1214 General Physics II and Laboratory
 - PHY 2014 Physics for Science & Engineering I and Lab
 - PHY 2114 Physics for Science & Engineering II and Lab
- Any non-required 2/3/4000 level MATH or STAT courses with the following exceptions: MATH 2013, 2053, 2113, 2123, 2133, 2153, 2743, 3323, or 4843.

Elective Courses 9

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

- Application Development
- CMSC 3413 Enterprise Programming
- CMSC 4133 Concepts of Artificial Intelligence
- CMSC 4143 Algorithms for Machine Learning
- CMSC 4303 Mobile Apps Programming
- CMSC 4313 Internet of Things
- CMSC 4373 Cloud Web Apps Development
- Cybersecurity **
- CMSC 4163 Secure Systems Administration and Certification
- CMSC 4323 Network Security
- CMSC 4333 Incident Analysis and Response I

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

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

**Minimum
Required Hours**

- CONTINUED ON NEXT PAGE -
 - CONTINUED FROM PREVIOUS PAGE -

- CMSC 4343 Cyber Operations
- CMSC 4353 Incident Analysis and Response II

** Students who choose the Cybersecurity application area are recommended to take CMSC 4063 Computer Networks and/or CMSC 4153 Operating Systems as prerequisites. CMSC 4063 and 4153 can be counted in the "Elective CMSC or SE courses" section.

System Development

- CMSC 4023 Programming Languages
- CMSC 4063 Computer Networks
- CMSC 4153 Operating Systems
- CMSC 4173 Translator Design
- CMSC 4193 Introduction to Robotics
- CMSC 4223 Cyber Infrastructure and Cloud Computing

Elective CMSC or SE Courses..... 6
 Any 2/3/4000 level CMSC or SE courses except CMSC 4513

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

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

Electives to bring total to..... 124

Minimum Grade Requirements

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

Accelerated BS/PSM

UCO's P.S.M. (Professional Science Master's) in Computational Science has partnered with the B.S. in Software Engineering so that approved students may take up to nine credit hours of 5000-level CMSC courses during their senior year of the B.S. program. These courses will count toward both the B.S. and P.S.M. degrees. A formal application to the P.S.M. Computational Science program and an approval from the Department of Computer Science are required. Requirements for the P.S.M. program are located in the UCO Graduate Catalog under Computational Science - Computer Science, P.S.M.

Up to nine credit hours of the following courses can be used to satisfy both the B.S. Software Engineering and the P.S.M. Computational Science - Computer Science:

- CMSC 5043 Applications Database Systems
- CMSC 5283 Software Engineering I
- CMSC 5323 Computer and Network Security

College of Math and Science Minors

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

Minimum Requirements for Minors

Minimums for minors unless otherwise specified:

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

Biology

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

Minor Code: 6019

Required courses:..... 12

BIO 1204	Biology for Majors: Principles
BIO 1224	Biology for Majors: Diversity
BIO 2203	Cell Biology
BIO 2211	Cell Biology Laboratory

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

Select 2 courses from this list:

BIO 3054	Microbiology for Majors
BIO 3303	Genetics
BIO 3543	General Ecology
BIO 3703	Evolution

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

Chemistry

Chemistry

Minor Code: 6079

Required courses..... 14

CHEM 1103	General Chemistry I
CHEM 1112	General Chemistry I-Recitation/Lab
CHEM 1223	General Chemistry II
CHEM 1232	General Chemistry II-Recitation/Lab
CHEM 2104	Quantitative Analysis and Lab

Elective Chemistry (3/4000 level) 6

A grade of 'C' or better must be earned in all required CHEM courses.

Computer Science

Computer Science

Minor Code: 6119

Required courses..... 18

CMSC 1613	Programming in C++
CMSC 1621	Laboratory for Programming in C++
CMSC 2123	Discrete Structures
CMSC 2613	Fundamental Data Structures
CMSC 2621	Laboratory for Fundamental Data Structures
CMSC 2833	Computer Organization and Architecture I
CMSC 3613	Algorithms and Advanced Data Structures
CMSC 3621	Lab for Algorithms and Advanced Data Structures

Elective CMSC or SE Courses (3/4000 level)..... 3

A grade of 'C' or better must be earned in all required CMSC courses.

Engineering Physics

Engineering Physics

Minor Code: 6259

Required courses..... 14-15

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

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

Any 3000 or 4000 level ENGR course.

Grief, Death, and Dying

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

Minor Code: 6139

Required courses..... 9

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

Elective courses 9-10

Selected from the following:

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

Mathematics

Mathematics

Minor Code: 6179

Required courses..... 12

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

Elective Mathematics (3/4000 level) 6

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

Science Education

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

Minor Code: 6059

Required courses..... 18

College of Math and Science Minors - continued

PTE	4333	Meeting Secondary Students' Needs
PTE	4433	Designing Instruction for Secondary Students
PTE	4543	Managing Secondary Classrooms
PTE	4623	Secondary Class Assessment
BIO	4812	Teaching and Learning in Science Classrooms
BIO	4853	General Methods of Teaching Science and Lab
* BIO	4930	Individual Study in Biology (1 hour) OR
PHY	4930	Individual Study in Physics (1 hour) OR
CHEM	4930	Individual Study in Chemistry (1 hour)

* Students will take the Individual Study from the Science Education coordinator within their content area.

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

Statistics

Statistics 18

Minor Code: 6178

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

Certificate

Cybersecurity Certificate

UCO Code: 6090

Support Courses.....0-6

Students pursuing the Cybersecurity certificate are encouraged to complete the following courses in high school.

Advanced Placement High School Programming Course OR
CMSC 1513 Beginning Programming

MATH 1533 Precalculus-Algebra OR
MATH 1513 College Algebra OR
Placement Score

Required Courses..... 36

- ^CMSC 1613 Programming in C++
- ^CMSC 1621 Laboratory or Programming in C++
- ^ CMSC 2613 Fundamental Data Structures
- ^ CMSC 2621 Laboratory for Fundamental Data Structures
- ^CMSC 4063 Computer Networks
- ^CMSC 4083 Cybersecurity
- ^CMSC 4153 Operating Systems
- ^CMSC 4163 Secure System Administration and Certification
- ^CMSC 4223 Cyber Infrastructure and Cloud Computing
- ^CMSC 4323 Network Security
- ^CMSC 4333 Incident Analysis and Response I
- ^CMSC 4343 Cyber Operations
- ^CMSC 4401 Ethics in Computing
- ^STAT 2113 Statistical Methods OR
 - ^STAT 2103 Introduction to Statistics for Sciences OR
 - ^STAT 4113 Mathematical Statistics I

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

Total hours required 36*

**Total hours required for this certificate may exceed the minimum 36 credit hour requirement and will vary according to course selection. It is recommended students complete high school algebra II and an Advanced Placement programming course in high school.*

Minimum Grade Requirements

Average in all Certificate program college course work 2.00

Funeral Service Certificate

UCO Code: 6121

I. General Courses 27

The following courses:

- HLTH 1112 Healthy Life Skills
- ENG 1113 English Composition
- ENG 1213 English Composition and Research
- MCOM 1113 Fundamentals of Speech
- BIO 1114 General Biology **OR**
- BIO 1214 General Biology and Lab
- CHEM 1014 Introduction to Chemistry and Lab
- PSY 1103 General Psychology
- MATH 1453 Applied Algebra OR
higher level math

* FNRL 4522 Board Review

II. Basic Sciences11

The following courses:

- BIO 2314 Introduction to Microbiology and Lab
- FNRL 2214 Intro Human Anatomy and Dissection
- FNRL 3433 Introduction to Pathology

III. Mortuary Arts and Sciences 20

The following courses:

- FNRL 3054 Embalming Chemistry
- FNRL 3204 Embalming
- FNRL 3304 Restorative Art

* FNRL 4118 Practicum in Embalming and Funeral Directing

IV. Mortuary Administration..... 30

The following courses:

- FNRL 1211 Orientation to Funeral Service
- FNRL 2313 Contemporary Funeral Service
- FNRL 2413 Funeral Home Administration
- FNRL 3374 Funeral Home Management I
- FNRL 3383 Funeral Home Statutory Law
- FNRL 3393 Mortuary Jurisprudence
- FNRL 3493 Funeral Service Communication
- FNRL 3513 History of Funeral Directing
- FNRL 4214 Funeral Home Management II
- FNRL 3483 Psychology of Grief

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

Total hours required 88

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

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

Certificate

- CONTINUED FROM PREVIOUS PAGE -

The Department of Funeral Service Bachelor of Science Degree and Certificate of Completion Programs at the University of Central Oklahoma are accredited by the American Board of Funeral Service Education (ABFSE) 992 Mantua Pike, Suite 108, Woodbury Heights, NJ 08097 (816)233-3747 www.abfse.org
Student Learning Outcomes

Upon completion of the accredited Bachelor's Degree and Certificate program, students will be able to:

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