

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

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

University Core (Total Listed 42-44)

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

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

Written and Oral Communication 9

Quantitative Reasoning/Scientific Method 10-11

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

Critical Inquiry and Aesthetic Analysis 6

- Aesthetic Analysis 3
- Critical Inquiry 3

American Historical and Political Analysis 6

- American National Government 3
- American History 3

• Cultural and Language Analysis 3-4

- Second Language 4
- OR
- Cultural Analysis 3

• Social and Behavioral Analysis 3

Life Skills 5

- Required Health Course 2
- Elective Life Skills 3

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

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

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

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

Major Requirements

Biomedical Engineering 96-98

Biology 11

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

Chemistry 5

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

Engineering 48

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

**Minimum
Required Hours**

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

Mathematics 15

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

Physics 8

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

^ A grade of "C" or better must be earned in PHY 2114.

Biomedical Engineering Elective 3-6

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

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

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**Minimum
Required Hours**

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Complete all the courses from one of the following concentrations:
 **3-8**

- Concentration A: (courses in preparation for Pre-Med fields)
 CHEM 1223 General Chemistry II
 CHEM 1232 General Chemistry II Recitation/Laboratory
 CHEM 3303 Organic Chemistry I
- Concentration B: (courses in preparation for Instrumentation fields)
 PHY 3883 Mathematical Physics I

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

- The following courses are strongly recommended electives:
 BME 4243 Modeling and Analysis of Biomedical Systems
 #ENGR 3443 Fluid Mechanics
 CHEM 3403 Biochemistry I
 CHEM 3323 Organic Chemistry II (for Concentration A)
 #ENGR 3183 Electromagnetic Fields I (for Concentration B)

Admission into Engineering and Physics Upper Division is required.

Minimum Grade Requirements

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

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

Admission into Engineering and Physics Upper Division

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

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

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

- Completed the following courses or their equivalent with a minimum grade of "C" by the time the student is formally admitted into upper division:

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

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