### CHEMICAL ENGINEERING: BIOMEDICAL/BIOCHEMICAL, BSCH

**Requirements for Students Matriculating in or before Academic Year 2019-2020.** Learn more about University Academic Regulation 3.1 (http://catalog.okstate.edu/university-academic-regulations/#matriculation).

**Minimum Overall Grade Point Average:** 2.00  
**Total Hours:** 134

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<th>Title</th>
<th>Hours</th>
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| **General Education Requirements**

All General Education coursework requirements are satisfied upon completion of this degree plan

- **English Composition**
  
  See Academic Regulation 3.5 (http://catalog.okstate.edu/university-academic-regulations/#english-composition)
  
  ENGL 1113 Composition I 3  
  or ENGL 1313 Critical Analysis and Writing I

Select one of the following: 3

- ENGL 1213 Composition II
- ENGL 1413 Critical Analysis and Writing II
- ENGL 3323 Technical Writing

- **American History & Government**

Select one of the following: 3

- HIST 1103 Survey of American History
- HIST 1483 American History to 1865 (H)
- HIST 1493 American History Since 1865 (DH)
- POLS 1113 American Government 3

- **Analytical & Quantitative Thought (A)**

  MATH 2144 Calculus I (A) 4  
  MATH 2153 Calculus II (A) 3  
  MATH 2163 Calculus III 1

- **Humanities (H)**

  PHIL 3833 Biomedical Ethics (H) (or equivalent with Chemical Engineering Advisor approval) 3

Select 3 hour course designated (H) 3

- **Natural Sciences (N)**

  Must include one Laboratory Science (L) course

  CHEM 1515 Chemistry II (LN) 1 5  
  BIOL 1114 Introductory Biology (LN) 1

- **Social & Behavioral Sciences (S)**

  Any course designated (S) 6

**Hours Subtotal** 43

- **Diversity (D) & International Dimension (I)**

  May be completed in any part of the degree plan

  Select at least one Diversity (D) course

  Select at least one International Dimension (I) course

- **College/Departmental Requirements**

  **Basic Science**

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<tr>
<td>PHYS 2014</td>
<td>University Physics I (LN) 1</td>
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<tr>
<td>PHYS 2114</td>
<td>University Physics II (LN) 1</td>
<td>4</td>
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### Engineering

- **ENGR 1111** Introduction to Engineering 1  
- **ENGR 1412** Introductory Engineering Computer Programming 2

### Engineering Science

- **ENSC 2113** Statics 3  
- **ENSC 2143** Strength of Materials 3  
- **ENSC 2613** Introduction to Electrical Science 3  
- **ENSC 2213** Thermodynamics 1 3  
- **ENSC 3233** Fluid Mechanics 1 3  
- **ENSC 3313** Materials Science 3

### Mathematics

Select one of the following: 3

- STAT 2013 Elementary Statistics (A)
- STAT 2023 Elementary Statistics for Business and Economics (A)
- STAT 2053 Elementary Statistics for the Social Sciences (A)
- STAT 4013 Statistical Methods I (A)
- STAT 4033 Engineering Statistics
- STAT 4053 Statistical Methods I for the Social Sciences (A)
- STAT 4073 Engineering Statistics with Design of Experiments

### Chemistry

- **CHEM 3053** Organic Chemistry I 1 3

Select one of the following: 5

- CHEM 3153 Organic Chemistry II
- CHEM 3112 Organic Chemistry Laboratory 1
- BIOL 3653 Survey of Biochemistry
- & BIOL 3723 and Biochemistry and Molecular Biology Laboratory 1

**Hours Subtotal** 40

### Major Requirements

- **Mathematics**

  MATH 2233 Differential Equations 1 3  
  or MATH 3263 Linear Algebra and Differential Equations

- **Chemistry**

  CHEM 3433 Physical Chemistry I 3

### Chemical Engineering

- **CHE 2033** Introduction to Chemical Process Engineering 1 3  
- **CHE 2581** Chemical Engineering Seminar I 1  
- **CHE 3013** Rate Operations I 3  
- **CHE 3113** Rate Operations II 3  
- **CHE 3123** Chemical Reaction Engineering 3  
- **CHE 3333** Introduction to Transport Phenomena 3  
- **CHE 3473** Chemical Engineering Thermodynamics 3  
- **CHE 3581** Chemical Engineering Seminar II 1  
- **CHE 4002** Chemical Engineering Laboratory I 2  
- **CHE 4112** Chemical Engineering Laboratory II 2
### Controlled Electives

#### Advanced Chemical Science

Select 3 hours of the following or similar advanced chemical transformation of matter courses approved by advisors:

- ANSI 3423: Animal Genetics
- BIOC 3653: Survey of Biochemistry
- BIOC 3723: Biochemistry and Molecular Biology Laboratory
- BIOC 4113: Molecular Biology
- BIOL 3023: General Genetics
- CHEM 3153: Organic Chemistry II
- CHEM 3353: Descriptive Inorganic Chemistry
- CHEM 3553: Physical Chemistry II
- CHEM 4023: Modern Methods of Chemical Analysis
- FDSC 3373: Food Chemistry I
- FDSC 4373: Food Chemistry II
- GEOL 4403: Geochemistry
- MICR 3033: Cell and Molecular Biology

#### Bioengineering/Bioscience Electives

Select 6 hours of the following:

- BAE 3113: Biological Applications in Engineering
- BAE 4413: Food Engineering
- BIOC 3223: Physical Chemistry for Biologists
- BIOC 3653: Survey of Biochemistry
- BIOC 4113: Molecular Biology
- BIOC 5824: Biochemical Laboratory Methods
- BIOL 1604: Animal Biology
- BIOL 3023: General Genetics
- CHE 4283: Bioprocess Engineering
- CHE 4293: Biomedical Engineering
- CHE 5283: Advanced Bioprocess Engineering
- CHE 5293: Advanced Biomedical Engineering
- MICR 2123: Introduction to Microbiology
- MICR 2132: Introduction to Microbiology Laboratory
- MICR 3033: Cell and Molecular Biology

### Hours Subtotal

- CHE 4124: Chemical Engineering Design I 4
- CHE 4224: Chemical Engineering Design II 4
- CHE 4581: Chemical Engineering Seminar III 1
- CHE 4843: Chemical Process Instrumentation and Control 3

**Total Hours:** 42

### Total Hours

**134**

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1. Courses that must be completed prior to admission to professional school.
2. Cannot use both ANSI 3423 Animal Genetics & BIOL 3023 General Genetics or BIOC 3653 Survey of Biochemistry & BIOC 3713 Biochemistry I.