**CHEMICAL ENGINEERING: BIOMEDICAL/BIOCHEMICAL, BSCH**

Requirements for Students Matriculating in or before Academic Year 2021-2022. Learn more about University Academic Regulation 3.1 ([link](http://catalog.okstate.edu/university-academic-regulations/#matriculation)).

Minimum Overall Grade Point Average: 2.00
Total Hours: 134

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1113</td>
<td>Composition I</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 1313</td>
<td>Critical Analysis and Writing I</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1213</td>
<td>Composition II</td>
<td></td>
</tr>
<tr>
<td>ENGL 1413</td>
<td>Critical Analysis and Writing II</td>
<td></td>
</tr>
<tr>
<td>ENGL 3323</td>
<td>Technical Writing</td>
<td></td>
</tr>
</tbody>
</table>

### 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                                                    |       |

### Analytical & Quantitative Thought (A)
- MATH 2144 | Calculus I (A)                                                         | 4     |
- MATH 2153 | Calculus II (A)                                                        | 3     |
- MATH 2163 | Calculus III                                                           | 3     |

### 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)                                                     | 5     |
- BIOL 1114 | Introductory Biology (LN)                                             | 4     |

### 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 2014</td>
<td>University Physics I (LN)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 2114</td>
<td>University Physics II (LN)</td>
<td>4</td>
</tr>
</tbody>
</table>

### 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                                                          | 3     |
- ENSC 3233 | Fluid Mechanics                                                         | 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                                                   | 3     |
Select one of the following: 5
- CHEM 3153 | Organic Chemistry II                                                  |       |
- BIOC 3653 | Survey of Biochemistry                                                |       |
- & CHEM 3112 | Organic Chemistry Laboratory                                           |       |
- & BIOC 3723 | and Biochemistry and Molecular Biology Laboratory                     |       |

### Hours Subtotal 40

### Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 2233</td>
<td>Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 3263</td>
<td>Linear Algebra and Differential Equations</td>
<td></td>
</tr>
</tbody>
</table>

### Chemistry
- CHEM 3433 | Physical Chemistry I                                                  | 3     |

### Chemical Engineering
- CHE 2033 | Introduction to Chemical Process Engineering                           | 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     |
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

Hours Subtotal  42

Controlled Electives
Advanced Chemical Science
Select 3 hours
ANSI 3423  Animal Genetics
BIOC 3223  Physical Chemistry for Biologists
BIOC 3653  Survey of Biochemistry
BIOC 3713  Biochemistry I
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:  6
BAE 3113  Biological Applications in Engineering
BAE 4413  Food Engineering
BIOC 3223  Physical Chemistry for Biologists
BIOC 3653  Survey of Biochemistry
BIOC 3713  Biochemistry I
BIOC 3723  Biochemistry and Molecular Biology Laboratory
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  and Introduction to Microbiology Laboratory
MICR 3033  Cell and Molecular Biology

Hours Subtotal  9
Total Hours  134

Graduation Requirements
1. A minimum GPA of 2.00 is required in all CHE coursework.
2. Must Receive a "C" or better in the following CHE courses: CHE 2033, CHE 3013, CHE 3113, CHE 3123, CHE 3333, CHE 3473, and CHE 4002.
3. The major engineering design experience, capstone course, is satisfied by CHE 4124 Chemical Engineering Design I and CHE 4224 Chemical Engineering Design II.

Additional State/OSU Requirements
- At least: 60 hours at a four-year institution; 30 hours completed at OSU; 15 of the final 30 or 50% of the upper-division hours in the major field completed at OSU.
- Limit of: one-half of major course requirements as transfer work; one-fourth of hours earned by correspondence; 8 transfer correspondence hours.
- Students will be held responsible for degree requirements in effect at the time of matriculation and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation.
- Degrees that follow this plan must be completed by the end of Summer 2027.

1 Cannot use both ANSI 3423 Animal Genetics & BIOL 3023 General Genetics or BIOC 3653 Survey of Biochemistry & BIOC 3713 Biochemistry I.