CHEMICAL ENGINEERING: BIOMEDICAL/BIOCHEMICAL, BS

Requirements for Students Matriculating in or before Academic Year 2018-2019. 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ENGL 1113</td>
<td>Composition I</td>
<td>3</td>
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<tr>
<td>or ENGL 1313</td>
<td>Critical Analysis and Writing I</td>
<td></td>
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<tr>
<td>ENGL 1213</td>
<td>Composition II</td>
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<tr>
<td>ENGL 1413</td>
<td>Critical Analysis and Writing II</td>
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<tr>
<td>ENGL 3323</td>
<td>Technical Writing</td>
<td>3</td>
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American History & Government
Select one of the following:
- HIST 1103 | Survey of American History | 3 |
- HIST 1483 | American History to 1865 | 3 |
- HIST 1493 | American History Since 1865 | 3 |
- 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 (A) | 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

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>PHYS 2014</td>
<td>University Physics I (LN)</td>
<td>4</td>
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<tr>
<td>PHYS 2114</td>
<td>University Physics II (LN)</td>
<td>4</td>
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<tr>
<td>ENGR 1111</td>
<td>Introduction to Engineering</td>
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<tr>
<td>ENGR 1412</td>
<td>Introductory Engineering Computer Programming</td>
<td>2</td>
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<tr>
<td>ENSC 2113</td>
<td>Statics</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 2143</td>
<td>Strength of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 2613</td>
<td>Introduction to Electrical Science</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 2213</td>
<td>Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 3233</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ENSC 3313</td>
<td>Materials Science</td>
<td>3</td>
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Mathematics
Select one of the following:
- STAT 2013 | Elementary Statistics (A) | 3 |
- STAT 2023 | Elementary Statistics for Business and Economics (A) | 3 |
- STAT 2053 | Elementary Statistics for the Social Sciences (A) | 3 |
- STAT 4013 | Statistical Methods I (A) | 3 |
- STAT 4033 | Engineering Statistics | 3 |
- STAT 4053 | Statistical Methods I for the Social Sciences (A) | 3 |
- STAT 4073 | Engineering Statistics with Design of Experiments | 3 |

Chemistry
- CHEM 3053 | Organic Chemistry I | 3 |

Select one of the following:
- CHEM 3153 & CHEM 3112 | Organic Chemistry Laboratory | 5 |
- BIOL 3653 & BIOL 3723 | Survey of Biochemistry and Biochemistry and Molecular Biology Laboratory | 5 |

Hours Subtotal | 40 |

Major Requirements

Mathematics
- MATH 2233 | Differential Equations | 3 |
- MATH 3263 | Linear Algebra and Differential Equations | 3 |

Chemistry
- CHEM 3433 | Physical Chemistry I | 3 |

Chemical Engineering
- CHE 2033 | Introduction to Chemical Process Engineering | 3 |
- CHE 2581 | Chemical Engineering Seminar | 3 |
- 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 I | 3 |
- 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 of the following or similar advanced chemical transformation of matter courses approved by advisors:  3

- 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:  6

- 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 & MICR 2132  Introduction to Microbiology and Introduction to Microbiology Laboratory
- MICR 3033  Cell and Molecular Biology

Hours Subtotal  9

Total Hours  134

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.

Other Requirements

Admission to Professional School (required)
- Refer to the OSU Catalog corresponding to your matriculation date for detailed admissions requirements.

Graduation Requirements
1. A minimum GPA of 2.00 is required in all CHE, CHEM, ENGR, and ENSC coursework.
2. 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 2024.