

# CHEMICAL ENGINEERING: BIOMEDICAL/BIOCHEMICAL, BSCH

**Requirements for Students Matriculating in or before Academic Year 2025-2026.** 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: 127**

Code	Title	Hours
<b>General Education Requirements</b>		
<i>English Composition</i>		
See Academic Regulation 3.5 ( <a href="http://catalog.okstate.edu/university-academic-regulations/#english-composition">http://catalog.okstate.edu/university-academic-regulations/#english-composition</a> )		
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	
<i>American History &amp; Government</i>		
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
<i>Quantitative Thought &amp; Logical Reasoning (Q)</i>		
MATH 2144	Calculus I (Q)	4
MATH 2153	Calculus II (Q)	3
<i>Understanding Humanities-Human Heritage &amp; Cultures (H)</i>		
Courses designated (H)		3
Courses designated (DH)		3
<i>Reasoning in the Natural Sciences (N)</i>		
Must include one Laboratory-Based Inquiry (L) course		
CHEM 1314	Chemistry I (LN)	4
CHEM 1515	Chemistry II (LN)	5
BIOL 1113	Introductory Biology (N)	4
& BIOL 1111	and Introductory Biology Laboratory (LN)	
or BIOL 1114	Introductory Biology (LN)	
PHYS 2014	University Physics I (LN)	4
<i>Exploring Society &amp; Human Behavior (S)</i>		
Courses designated (GS)		3
<i>Diversity (D)</i>		
Courses designated (D)		
May be paired with another designated course		
<i>Global Cultural Competency (G)</i>		
Courses designated (G)		
May be paired with another designated course		
<i>Additional General Education</i>		

Additional general education credit hours may be required to meet the total 40-hour minimum of general education credit if courses carry more than one general education designation and can be used to meet multiple general education designation hour requirements above.

Courses designated (Q), (H), (N), (S), (D), (G), or (F). 0

**Hours Subtotal 45**

## College/Departmental Requirements

UNIV 1111	First Year Seminar (or other approved first year seminar course)	1
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### Basic Science

#### Engineering

ENGR 1412	Introductory Engineering Computer Programming	2
ENGR 2421	Engineering Data Acquisition Controls Lab	1

#### Engineering Science

ENSC 2113	Statics	3
ENSC 2613	Introduction to Electrical Science	3
ENSC 3231	Fluids and Hydraulics Lab	1
ENSC 3233	Fluid Mechanics	3
ENSC 3313	Materials Science	3

#### Mathematics

MATH 2163	Calculus III	3
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#### Chemistry

CHEM 3053	Organic Chemistry I	3
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Select one of the following: 5

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

**Hours Subtotal 28**

## Major Requirements

### Mathematics

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

### Chemical Engineering

CHE 2023	Introduction to Chemical Engineering Thermodynamics	3
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 3543	Introduction to Chemical Process Analytics	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
<b>Hours Subtotal</b>		<b>45</b>
<b>Controlled Electives</b>		
<i>Advanced Chemical Science</i>		
Select 3 hours from the following:		3
CHE 3202	Interdisciplinary Design and Build for Chemical Systems I	
or CHE 3211	Interdisciplinary Design and Build for Chemical Systems II	
CHE 4073	Introduction to Tissue Engineering	
CHE 4133	Introduction to Catalysis and Photocatalysis	
CHE 4283	Bioprocess Engineering	
CHE 4293	Biomedical Engineering	
CHE 4323	Electrochemical Engineering	
CHE 4343	Environmental Engineering	
CHE 4493	Introduction to Molecular Modeling and Simulation	
CHE 4523	Introduction to Colloid Processing	
CHE 4533	Colloidal and Interfacial Phenomena	
CHE 4543	Machine Learning for Chemical Processes	
CHE 4603	Introduction to Membrane Separations	
CHE 4753	Introduction to Applied Numerical Computing for Scientists and Engineers	
CHE 4773	Introduction to Computational Fluid-Particle Dynamics	
<i>Bioengineering/Bioscience Electives</i>		
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 <sup>1</sup>	
BIOC 3713	Biochemistry I <sup>1</sup>	
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 & MICR 2132	Introduction to Microbiology and Introduction to Microbiology Laboratory	
MICR 3033	Cell and Molecular Biology	
<b>Hours Subtotal</b>		<b>9</b>
<b>Total Hours</b>		<b>127</b>

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

## 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 2023, CHE 2033, CHE 3013, CHE 3113, CHE 3123, CHE 3333, CHE 3473, CHE 3543, 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 and 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 2031.