IOWA | Chemical and Biochemical Engineering

BIOCHEMICAL ENGINEERING FOCUS AREA

Summary

The biochemical engineering focus area prepares students to design, analyze, and optimize processes that use biological materials and living systems to create valuable products. Building on a foundation in chemical engineering, students explore biochemistry, molecular biology, bioinformatics, genetics, and bioseparations to understand the development and manufacture of pharmaceuticals, biologics, and other biotechnology products. This pathway prepares students for careers in biopharmaceutical manufacturing, biotechnology, process development, research and development, and emerging areas of bio-based production where engineering and life sciences intersect.

Focus Area Requirements

In addition to the core chemical engineering requirements, you must choose a focus area and complete 12 s.h. toward that focus area. Below are the lists of possible focus areas electives that can fulfill this requirement for the biochemical engineering focus area. If you feel another course would fit within this requirement, you must get approval from the department undergraduate director to have it count.

Required Focus Area Elective 3 s.h.

Offered	Course	s.h.
S-EVEN	CBE:5210 Bioseparations	3

Focus Area Electives 9 s.h. (pick from list below)

Offered	Course	s.h.
S-EVEN	CBE:4125 Advanced Process Safety	3
F-EVEN	CBE:5410 Electrochemical Engineering	3
F/S	BMB:3110 Biochemistry (this is overview and should not be taken with BMB:3120/BMB:3130)	3
F/S	BMB:3120 Biochemistry and Molecular Biology I	3
F/S	BMB:3130 Biochemistry and Molecular Biology II	3
S	BMB:3140 Experimental Biochemistry	3
F	BMED:5207 Principles of Molecular and Cellular Biology	3
F/S	BME:2400 Cell and Tissue Engineering Fundamentals (P: BIOL:1411)	3
F	BME:4310 Computational Biochemistry	3
F	BME:5430 Biotransport	3
S	BME:5335 Computational Bioinformatics	3
F/S	BIOL:1411 Foundations of Biology	4
ALL	BIOL:1412 Diversity of Form and Function	3
ALL	BIOL:2512 Fundamental Genetics (P: BIOL:1411)	3
F/S	BIOL:2723 Cell Biology (P: BIOL:1411)	3
F/S	MICR:2157 General Microbiology (P: BIOL:1411)	3
F/S	MICR:2158 General Microbiology Lab (P: BIOL:1411)	3
	3000+ level in BIOL, BMB, BIOS, MICR	3

Other Electives that Align with this Focus Area

In addition to the focus area electives listed above, you will be required to complete the following electives to complete your degree: the Advanced Chemistry Elective (3 s.h.), the Advanced Chemistry Lab Elective, the Advanced Science Elective (3 s.h.), the Statistics Elective (3 s.h.), a free elective (3 s.h.), the Engineering Be Creative General Education Elective (3 s.h.), the Understanding Cultural Perspectives, Values, & Society General Education Elective (3 s.h.), and additional general education requirements (9 s.h.). ***These do not count toward your focus area electives.*** Below are lists of possible courses to fulfill these requirements that align with this focus area.

Statistics Requirement 3 s.h. (possible courses that align with this focus area)

Offered	Course	s.h.
S	CBE:3020 Applied Statistics for Chemical and Natural Resources Engineering	3
F/S	STAT:2020 Probability and Statistics for Engineers	3
F/S	STAT:3510 Biostatistics (recommended)	3

Advanced Chemistry Elective 3 s.h (possible courses that align with this focus area)

Offered	Course	s.h.
F/S	BMB:3110 Biochemistry	3
ALL	CHEM 3000+ level	3

Advanced Chemistry Lab Elective 3 s.h. (possible courses that align with this focus area)

Offered	Course	s.h.
F/S	CHEM:2210 Fundamentals of Chemical Measurements Lab	3
F/S	CHEM:2220 Organic Chemistry Lab	3
S	CHEM:2240 Organic Chemistry for Majors Lab	3

Advanced Science Elective 3 s.h. (possible courses that align with this focus area)

Offered	Course	s.h.
ALL	BIO 3000+ level course	3
ALL	BMB 3000+ level course	3
ALL	CHEM 3000+ level course	3