

PHARMACEUTICALS FOCUS AREA

Summary

The pharmaceuticals focus area helps chemical engineering students apply core engineering principles to the design, formulation, and manufacturing of drug products. It introduces foundational knowledge in biology, drug delivery, and the chemistry behind therapeutic mechanisms, reflecting the central role chemical and biochemical engineers play in pharmaceutical development. This pathway prepares students for careers in biopharmaceutical production, drug formulation, and health-focused product development.

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 area electives that can fulfill this requirement for the pharmaceuticals 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. (pick one from list below)

Offered	Course	s.h.
F	PCOL:3101 Pharmacology I: Drug's Fantastic Journey	3

Focus Area Electives 11 s.h. (pick from list below)

Offered	Course	s.h.
F-ODD	CBE:5740 Engineering Principles of Drug Delivery	3
S-EVEN	CBE:5210 Bioseparations	3
S – ODD	CBE:5310 Polymer Science and Technology	3
F-EVEN	CBE:5315 Polymer Chemistry	3
F	ISE:3600 Quality Control (P: STAT:2020)	3
F/S	PHAR:1812 What's in my Medicine Cabinet	3
F	PHAR:4146 Drug Disposition and Pharmacokinetics (P: BIOL:1141, STAT:2020)	3
F-EVEN	PHAR:4800 Chemical and Biophysical Properties of Drugs	3
F	OEH:6450 Aerosol Technology	3
S	OEH:6710 Human Toxicology and Risk Assessment	3
S	PCOL:2220 Drug use and Abuse	3
ALL	PCOL 3000+ level	3
ALL	PHAR 3000+ level	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 Engineering Be Creative General Education Elective (3 s.h.), and the Cultural Perspectives, Values, & Society General Education Elective (3 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 *recommended*	3
ALL	STAT:2020 Probability and Statistics for Engineers	3
ALL	STAT:3510 Biostatistics	3

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

Offered	Course	s.h.
F/S	BIOL:1411 Foundations of Biology	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
S	CHEM:4760 Radiochemistry: Energy, Medicine and the environment	3
ALL	BMB 3000+ level	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.
ALL	CHEM:2210 Fundamental of Chemical Measurements Lab	3
ALL	CHEM:2220 Organic Chemistry Lab	3
ALL	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.
F-EVEN	CBE:5315 Polymer Chemistry (if not taken as focus area)	3
ALL	See Advanced Science List	3

Cultural Perspectives, Values, & Society Gen Education Elective 3 s.h. (possible courses that align with this focus area)

Offered	Course	s.h.
F/S	WRIT:2100 Writing and Community Outreach	3
F	GHS:2100 Foundation of Health Humanities	3
F/S	PHIL:1401 Matters of Life and Death	3

General Education Elective 9 s.h. (possible courses that align with this focus area)

Offered	Course	s.h.
F/S	GHS:2000 Intro to Global Health Studies	3
F	GHS:3500 Global Public Health	3