(For students admitted in 2021-22 under the 4-year degree)

BEng in Chemical Engineering

In addition to the requirements of their major programs, students are required to complete the University requirements for graduation. For details please refer to the respective section on this website.

Some courses can be used to fulfill both Major and University Common Core Requirements. Students may reuse a maximum of 9 credits of these courses to count towards both Requirements.

Students may use no more than 6 credits earned from courses offered in self-paced online delivery mode to satisfy the graduation requirements of a degree program. This 6-credit limit does not apply to credits obtained through the credit transfer procedures of the University.

For students graduating with an additional major, they must take all the requirements specified for that major, within which they must complete at least 20 single-counted credits. These 20 credits cannot be used to fulfill any other requirements for graduation except for the 120-credit degree requirement.

Major Requirements

Engineering Fundamental Course(s)

			Credit(s) attained
COMP		Note: COMP 1021 OR COMP 1022P OR COMP 2011 OR COMP 2012H	3-5
COMP	1021	Introduction to Computer Science	3
COMP	1022P	Introduction to Computing with Java	3
COMP	2011	Programming with C++	4
COMP	2012H	Honors Object-Oriented Programming and Data Structures	5
ENGG	1010	Academic Orientation	0
CHEM		Note: CHEM 1010 OR CHEM 1012	3
CHEM	1010	General Chemistry IA	3
CHEM	1012	General Chemistry B: Atomic Structure, Molecules, and Bonding Theories	3
LANG	2030	Technical Communication I	3
MATH		Note: [(MATH 1012 OR MATH 1013 OR MATH 1023) AND (MATH 1014 OR MATH 1024)] OR [MATH 1020]	4-7
MATH	1012	Calculus IA	4
MATH	1013	Calculus IB	3
MATH	1014	Calculus II	3
MATH	1020	Accelerated Calculus	4
MATH	1023	Honors Calculus I	3
MATH	1024	Honors Calculus II	3
MATH	2011	Introduction to Multivariable Calculus	3
PHYS		Note: PHYS 1112 OR PHYS 1312	3
PHYS	1112	General Physics I with Calculus	3
PHYS	1312	Honors General Physics I	3

Required Course(s)

			Credit(s) attained
CENG		Note: CENG 1000 OR CENG 1500	3
CENG	1000	Introduction to Chemical and Biological Engineering	3
CENG	1500	A First Course on Materials Science and Applications	3
CENG	1010	Academic and Professional Development I	0
CENG/BIEN		Note: CENG 1600 OR CENG 1700 OR BIEN 1010	3
CENG	1600	Biotechnology and Its Business Opportunities	3
CENG	1700	Introduction to Environmental Engineering	3
BIEN	1010	Introduction to Biomedical Engineering	3
CENG	1980	Industrial Training	0
CENG	2110	Process and Product Design Principles	3
CENG	2210	Chemical and Biological Engineering Thermodynamics	3
CENG	2220	Transport Phenomena I	3
CENG	2310	Modeling for Chemical and Biological Engineering	3
CENG	3110	Process Dynamics and Control	3
CENG	3150	Integrated Chemical Process and Product Design	5
CENG	3210	Separation Processes	3
CENG	3220	Transport Phenomena II	3
CENG	3230	Chemical and Biological Reaction Engineering	3
CENG	3950	Chemical and Environmental Engineering Laboratory	4
CENG	4020	Academic and Professional Development II	0
CENG		Note: CENG 4920 OR CENG 4930 OR CENG 4940 (Students taking the Research Option must take CENG 4930)	6
CENG	4920	Chemical Engineering Capstone Design	6
CENG	4930	Chemical Engineering Thesis Research	6
CENG	4940	Chemical Engineering Industrial Project	6
BIEN/LIFS		Note: BIEN 2410 OR BIEN 2610 OR LIFS 1901	3
BIEN	2410	Cellular and Systems Physiology for Engineers	3
BIEN	2610	Chemical Biology for Engineers	3
LIFS	1901	General Biology I	3
ENGG	2010	Engineering Seminar Series	0
CHEM	1052	Laboratory for General Chemistry B	1
CHEM	2111	Fundamentals of Organic Chemistry	3
CHEM	2155	Fundamental Organic Chemistry Laboratory	1
LANG	4035	Technical Communication II for Chemical and Biological Engineering	3

Elective(s)

			Minimum credit(s) required
CENG/ENEG/ CHEM		CENG Electives (Courses from the specified list)	12
Area 1: Chemical Process Design			
CENG	4130	Plant Design and Economics	3
CENG	4140	Energy Resources, Conversions and Technologies	3
CENG	4620	Bioproducts and Processing	3
CENG	4630	Food Processing Technology	3
CENG	4670	Pharmaceutical Engineering	3
CENG	4710	Environmental Control	3
CENG	5210	Advanced Separation Processes	3
CENG	5230	Advanced Control and Data Science	3
Area 2: Chemical Product Design			
CENG	3300	Data Science for Molecular Engineering	3
CENG	4510	Nature Engineering and DNA Nanotechnology	3
CENG	4540	Nanomaterials and Applications in Chemical Engineering	3
CENG	4640	Biomolecular Engineering	3
CENG	4650	Biomaterials and Drug Delivery	3
CENG	4950	Chem-E-Car	3
CENG	5550	Polymer Physics and Advanced Applications	3
CENG	5840	Nanomaterials for Chemical Engineering Applications	3
CENG	5930	Electrochemical Energy Technologies	3
CENG	6000N	Deep Learning for Chemical and Biological Engineering	3
ENEG	4130	Photovoltaic Materials and Devices	3
CHEM	2311	Analytical Chemistry	3

Students may opt to graduate with or without an option. Students who take an option MUST complete all requirements specified in addition to the major requirements.

Option(s)

Research Option

Students must take CENG 4930 as specified in the Major Requirements.

Elective Course(s)			Minimum credit(s) required
CENG/BIEN		Research Electives (2 courses from the specified elective list, out of which at least 3 credits must be attained from CENG 4980. Students may take CENG 4980 for more than one term)	6
CENG		Any CENG courses at 5000-level	
CENG	4980	Investigation Project	3
BIEN		Any BIEN courses at 5000-level	