

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

## BEng in Chemical and Environmental 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 <u>OR</u> COMP 1022P <u>OR</u> COMP 2011 <u>OR</u> 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 <u>OR</u> CHEM 1020	3
CHEM	1010	General Chemistry IA	3
CHEM	1020	General Chemistry I	3
LANG	2030	Technical Communication I	3
MATH		Note: [(MATH 1012 <u>OR</u> MATH 1013 <u>OR</u> MATH 1023) <u>AND</u> (MATH 1014 <u>OR</u> MATH 1024)] <u>OR</u> [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 <u>OR</u> 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 <u>OR</u> 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	1700	Introduction to Environmental 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	4710	Environmental Control	3
CENG	4720	Environmental Impact Assessment and Management Systems	3
CENG		Note: CENG 4920 <u>OR</u> CENG 4930 <u>OR</u> 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/CHEM/ LIFS		Note: BIEN 2610 <u>OR</u> CHEM 2311 <u>OR</u> LIFS 1901	3
BIEN	2610	Chemical Biology for Engineers	3
CHEM	2311	Analytical Chemistry	3
LIFS	1901	General Biology I	3
ENGG	2010	Engineering Seminar Series	0
CHEM	1050	Laboratory for General Chemistry I	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)

			<b>Minimum credit(s) required</b>
SENG/ENVR		CEEV Depth Elective (2 courses from the specified elective list, of which at least 1 course should be taken from the list of Restricted Electives)	6
<b>Restricted Electives</b>			
CENG	4140	Energy Resources, Conversions and Technologies	3
CIVL	4450	Carbon Footprint Analysis and Reduction	3
ENEG	4320	Energy Storage Technology	3
ENVR	3110	Sustainable Development	3
ENVR	3220	Energy Sources and Usage	3
<b>Others</b>			
CENG	4130	Plant Design and Economics	3
CENG	4950	Chem-E-Car	3
CIVL	4470	Air Quality Control and Management	3
ENEG	3220	Energy Initiatives Forging Future Engineers	3
ENVR	3210	Environmental Technology	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.

<i>Elective Course(s)</i>			<b>Minimum credit(s) required</b>
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	