

(For students admitted in 2017-18 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 pure 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 1022Q <u>OR</u> COMP 2011 | 3-4 |
| COMP | 1021 | Introduction to Computer Science | 3 |
| COMP | 1022P | Introduction to Computing with Java | 3 |
| COMP | 1022Q | Introduction to Computing with Excel VBA | 3 |
| COMP | 2011 | Programming with C++ | 4 |
| 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 IB | 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 |
| MATH | 2350 | Applied Linear Algebra and Differential Equations | 3 |

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|------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 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 |
| SENG | | Engineering Introduction course (If the students take an introduction course included in their major, this course can be counted towards their major requirement.) | 3-4 |
| CENG | 1000 | Introduction to Chemical and Biological Engineering | 3 |
| CIVL | 1100 | Discovering Civil and Environmental Engineering | 3 |
| COMP | 1021 | Introduction to Computer Science | 3 |
| ELEC | 1100 | Introduction to Electro-Robot Design | 4 |
| ELEC | 1200 | A System View of Communications: from Signals to Packets | 4 |
| ENGG | 1100 | First Year Cornerstone Engineering Design Project Course | 3 |
| IEDA | 2010 | Industrial Engineering and Decision Analytics | 3 |
| IEDA | 2200 | Engineering Management | 3 |
| MECH | 1901 | Automotive Engineering | 3 |
| MECH | 1902 | Energy Systems in a Sustainable World | 3 |
| MECH | 1905 | Buildings for Contemporary Living | 3 |
| MECH | 1906 | Mechanical Engineering for Modern Life | 3 |

Required Course(s)

| | | | Credit(s) attained |
|-----------|------|---------------------------------------------------------|-------------------------------|
| CENG/BIEN | | Note: CENG 1000 <u>OR</u> BIEN 1010 | 3 |
| CENG | 1000 | Introduction to Chemical and Biological Engineering | 3 |
| BIEN | 1010 | Introduction to Biomedical Engineering | 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 | Process Fluid Mechanics | 3 |
| CENG | 3110 | Process Dynamics and Control | 3 |
| CENG | 3120 | Process Design and Integration | 3 |
| CENG | 3210 | Separation Processes | 3 |
| CENG | 3220 | Heat and Mass Transfer | 3 |
| CENG | 3230 | Chemical and Biological Reaction Engineering | 3 |
| CENG | 3950 | Chemical and Environmental Engineering Laboratory | 4 |
| CENG | 4130 | Plant Design and Economics | 3 |
| 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 | 6 |
| CENG | 4920 | Chemical Engineering Capstone Design | 6 |
| CENG | 4930 | Chemical Engineering Thesis Research | 6 |

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|-----------|------|-------------------------------------------------------------------------------------------------|---|
| CENG | 4940 | Chemical Engineering Industrial Project | 6 |
| BIEN/LIFS | | Note: BIEN 2610 <u>OR</u> LIFS 1901 <u>OR</u> LIFS 1902 <u>OR</u> LIFS 2040 <u>OR</u> LIFS 2210 | 3 |
| BIEN | 2610 | Chemical Biology for Engineers | 3 |
| LIFS | 1901 | General Biology I | 3 |
| LIFS | 1902 | General Biology II | 3 |
| LIFS | 2040 | Cell Biology | 3 |
| LIFS | 2210 | Biochemistry I | 3 |
| ENGG | 2010 | Engineering Seminar Series | 0 |
| CHEM | 1050 | Laboratory for General Chemistry I | 1 |
| CHEM | 2111 | Fundamentals of Organic Chemistry | 3 |
| CHEM | | Note: CHEM 2155 <u>OR</u> CHEM 2355 | 1 |
| CHEM | 2155 | Fundamental Organic Chemistry Laboratory | 1 |
| CHEM | 2355 | Fundamental Analytical Chemistry Laboratory | 1 |
| CHEM | 2311 | Analytical Chemistry | 3 |
| LANG | 4035 | Technical Communication II for Chemical and Biological Engineering | 3 |

Elective(s)

| | | | Minimum credit(s) required |
|--------------------|------|-------------------------------------------------------------------|-----------------------------------|
| SENG/SSCI/ ENVR | | CEEV Depth Elective (1 course from the specified elective list) | 3 |
| CENG | 4140 | Energy Resources, Conversions and Technologies | 3 |
| CENG | 4150 | Product and Process Design in Chemical and Biological Engineering | 3 |
| CIVL | 3420 | Water and Wastewater Engineering | 3 |
| CIVL | 4470 | Air Quality Control and Management | 3 |
| CHEM | 4310 | Environmental Chemistry | 3 |
| CHEM | 4320 | Environmental Analytical Chemistry | 3 |
| ENVR | 3110 | Sustainable Development | 3 |
| ENVR | 3210 | Environmental Technology | 3 |
| ENVR | 3220 | Energy Resources and Usage | 3 |
| ENVR | 3310 | Green Business Strategy | 3 |
| ENVR | 3410 | Economics for Environmental Policy and Management | 3 |
| ENVS | 2003 | Introduction to Atmospheric Science | 3 |

Student 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 should declare their intention to enroll in the option preferably at the end of their second year of study and no later than the end of the first term of their third year of study.

Required Course(s)

| | | | Credit(s) attained |
|------|------|-------------------------------------------------------------------------------------------------------|-----------------------|
| CENG | | Note: Attainment of a minimum of 6 credits from CENG 4980 by taking the course for at least two terms | 6 |
| CENG | 4980 | Investigation Project | 3 |