Chemical Engineering Technical Electives

At least one Chemical Engineering Technical Elective (3 credits) is required. Additional Chemical Engineering elective courses may be used as Technical Electives.

Additional Technical Electives

In addition to the Chemical Engineering Technical elective, 15 credit hours of Technical Electives are required (total of 18 credits). These Technical Electives can be used to earn a minor or major in a discipline related to Chemical Engineering. Alternatively, Technical Electives can be earned by meeting the requirements of the General Chemical Engineering program.

Majors and Minors in Related Disciplines

Courses used to earn a major or minor in a discipline related to Chemical Engineering may be used to meet the 15 required credit hours of technical electives. Majors or minors in the following disciplines are approved for the purpose of meeting the Technical Elective course requirements:

- Business
- Chemistry
- Computer Science
- Economics
- Engineering (any Engineering discipline in addition to Chemical Engineering)
- Geology
- Management
- Mathematics
- Molecular Biology
- Physics

A dual degree program in Chemical Engineering and Petroleum Engineering can be completed in 5 years. Please see you advisor for details.

Majors and minors in other disciplines may be used as technical electives, but require approval by the Department of Chemical Engineering. **Please see the appropriate department for minor or second major requirements. The corresponding department will assign you a minor or second major advisor.**

For a student to use these courses as their Chemical Engineering technical electives, the student must formally declare and successfully complete the minor or second major. If a student fails to do this, then they will be subject to the General Chemical Engineering technical elective requirements.
Courses at any level (freshman through graduate) may be used as technical electives so long as they are required by the minor or second major program. **A minimum of 48 upper division (3000+) credit hours is required for the B.S. in Chemical Engineering degree**.

General Chemical Engineering Technical Electives

Students who are not using a minor or second major in a related discipline to meet their Technical Electives requirement are subject to the General Chemical Engineering Technical Electives requirements. Generally, a technical elective must be an upper division (3000+) course in science, engineering, or math. Lower division classes may also be used as technical electives, but only if they are prerequisites for upper division technical electives. If the upper division course is not completed, then the lower division course may not be used as a technical elective.

The following courses **may not** be used as technical electives:
1. Any course that has a University Studies H designation. This includes ARE 3030 History of Architecture.
2. Any course that is taught at a lower level than a required course. This includes CHEM 3550 Physical Chemistry for the Life Sciences.
3. COSC/MATH 3340 Introduction to Scientific Computing. This is because this course is very similar to a required course, CHE 2060 Chemical Engineering Computing.
4. PETE 3015 Multicomponent Thermodynamics. This is because this course is very similar to a required course, CHE 3015 Multicomponent Thermodynamics.
5. PETE 3025 Heat and Mass Transfer. This is due to the similarity to two required courses, CHE 3026 Heat Transfer and CHE 3028 Mass Transfer.

Pre-approved Technical Electives

The following courses are pre-approved as technical electives. Additional courses, including courses transferred from another college or university, may be approved as technical electives on a case-by-case basis. ***Disclaimer: The listed prerequisites may not be complete or up-to-date. Please check the UW catalog for current prerequisites.***

College of Agriculture and Natural Resources

	Prerequisites
MOLB 3610 Principles of Biochemistry	LIFE 1010, CHEM 2420
MOLB 4100 Clinical Biochemistry	MOLB 3610 or MOLB 4600
MOLB 4400 Immunology	MICR 2200
MOLB 4495 Bioinformatics	MOLB 3610
RNEW 3000 Tropical Ecology	LIFE 1010

College of Arts and Sciences

	Prerequisites
CHEM 3020 Environmental Chemistry	CHEM 2420
CHEM 4000 Career Skills	CHEM 4110 or concurrent enrollment
CHEM 4040 Chemical Literature	CHEM 2420, CHEM 4507
CHEM 4050 Solar Energy Conversion	CHEM 1060, PHYS 1201, MATH 2200
CHEM 4100 Inorganic Chemistry Laboratory	CHEM 2440, concurrent CHEM 4110
CHEM 4110 Introductory Inorganic Chemistry	CHEM 2420
CHEM 4230 Instrumental Methods of Chemical Analysis	CHEM 2230
CHEM 4400 Biological Chemistry	CHEM 2440
CHEM 4508 Physical Chemistry II	CHEM 4507

CHEM 4515 Applied Mathematics in Physical Chemistry I	CHEM 1060, MATH 2205
CHEM 4516 Applied Mathematics in Physical Chemistry II	CHEM 4515
CHEM 4525 Physical Chemistry Lab I Concurrent	CHEM 4507
CHEM 4530 Physical Chemistry Lab II CHEM 4525, concurrent	CHEM 4508
CHEM 4560 Molecular Modeling	CHEM 4507
LIFE 3050 Genetics	See catalog
LIFE 3600 Cell Biology	See catalog
MATH 2250 Elementary Linear Algebra	C or better in MATH 2200 or 2350
MATH 3310 Applied Differential Equations II	MATH 2210, MATH 2310
MATH 4440 Introduction to Partial Differential Equations I	MATH 2210, MATH 2310
STAT 4220 Basic Engineering Statistics	MATH 2205
STAT 4255 Mathematical Theory of Probability	MATH 2210
ZOO 3115 Human Systems Physiology	CHEM 1050, LIFE 1010
ZOO 4125 Integrative Physiology	ZOO 3115

College of Business

	Prerequisites
DSCI 4240 Computer Applications in Decision Sciences	IMGT 2400, DSCI 3210, STAT 2010
ECON 3010 Intermediate Macroeconomics	ECON 1010, ECON 1020, MATH 2200
ECON 3020 Intermediate Microeconomics	ECON 1010, ECON 1020, MATH 2200
ECON 4320 Mathematical Economics	ECON 3010, ECON 3020, MATH 2205
ECON 4350 Game Theory	ECON 3010, ECON 3020
ECON 4400 Environmental Economics	ECON 3020
ECON 4410 Natural Resource Economics	ECON 3020
ECON 4430 Energy Economics	ECON 3020, MATH 2200
FIN 3250 Corporate Finance	ACCT 1010, STAT class
IMGT 3400 Database Management Systems	IMGT 2400
IMGT 4020 Information Security	IMGT 3400
MGT 3110 Business Ethics	Sophomore
MGT 3210 Management and Organization	COM1

College of Engineering and Applied Science

All upper division courses except:

- ARE 3030 History of Architecture
- COSC 3340 Introduction to Scientific Computing
- PETE 3015 Multicomponent Thermodynamics

In addition, any course with a University Studies H designation may not be used as a technical elective.

School of Energy Resources

	Prerequisites
ERS 3010 Air Quality Management	CHEM 1020, COM1
ERS 4050 Solar Energy Conversion	CHEM 1060, PHYS 1210, MATH 2200

Areas of Emphasis

Areas of emphasis are suggested lists of Technical Electives that concentrate on an area of study related to Chemical Engineering. **Areas of emphasis are not listed on the diploma**. Since areas of emphasis are suggestions, rather than curriculum requirements, students are not required to strictly adhere to the courses listed in the concentration area. Students pursuing an area of emphasis are subject to the requirements for General Chemical Engineering Technical Electives.

Biological Engineering

12 credits of Chemical Engineering coursework:

	Prerequisites
CHE 3100 Fundamentals of Bioengineering	LIFE 1010
CHE 4100 Biochemical Engineering Concurrent	CHE 3100 or MOLB 2021
CHE 4160 Biomedical Engineering – Transport Processes	See catalog
CHE 4165 Biomaterials	LIFE 1010, CHEM 1050
Choose 6 credits from these courses:	
CHE 3900 Undergraduate Research	Consent of instructor
LIFE 3050 Genetics	See catalog
LIFE 3600 Cell Biology	See catalog
MICR 2021 General Microbiology	LIFE 1010, CHEM 1050
MOLB 2240 Medical Microbiology	LIFE 1010 12 | P a g e
MOLB 4100 Clinical Biochemistry	MOLB 3610 or MOLB 4600
MOLB 4400 Immunology	MICR 2220
MOLB 4495 Bioinformatics	MOLB 3610
ZOO 3115 Human Systems Physiology	CHEM 1050, LIFE 1010
ZOO 4125 Integrative Physiology	ZOO 3115

Chemical Process Industry

Courses from the following list, including 9 credits of Chemical Engineering electives:

	Prerequisites
CHE 4000 Environment, Technology, and Society	Junior, 2 lab sciences
CHE 4100 Biochemical Engineering	Concurrent CHE 3100 or MOLB 2021
CHE 4200 Industrial Chemical Production	CHEM 2420, concurrent CHE 3015
CHE 4210 Natural Gas Processes and Modeling	CHE 3070
CHE 4270 Advanced Process Simulation	CHE 3070
CHE 4970 Internship in Chemical Engineering Concurrent CHE internship	
EE 4620 Automatic Control Systems	EE 2220
EE 5885 Topics: Process Control	Instructor approval
ES 4910 Survey of Engineering Management	See instructor

MGT 3110 Business Ethics	Sophomore
MGT 3210 Management and Organization	COM1
STAT 4220 Basic Engineering Statistics	MATH 2205

Environmental Engineering

Take the following courses:

	Prerequisites
ATSC 2100 Global Warming	None
CE 3400 Introduction to Environmental Engineering	MATH 2205, CHEM 1050
CHE 4000 Environment, Technology, and Society	Junior, 2 lab sciences
Take one of the following courses:	
CHE 3100 Fundamentals of Bioengineering	LIFE 1010
CHE 4100 Biochemical Engineering	Concurrent CHE 3100 or MOLB 2021
Select additional courses from this list:	
MICR 2021 General Microbiology	LIFE 1010, CHEM 1050
CE 4400 Design of Water Treatment Facilities	CE 3400
CE 4410 Design of Wastewater Treatment Facilities	CE 3400
CE 4430 Environmental Engineering Chemistry	CE 3400
CE 4441 Solid Waste Engineering	CE 3400, CHEM 1050
CHE 3900 Undergraduate Research (on appropriate topic)	Instructor consent.

Graduate School Preparation

Select courses from the following list, including 3 credits of Undergraduate Research and 6 additional credits of Chemical Engineering electives:

	Prerequisites	
CHE 3900 Undergraduate Research (up to 6 credits)	Instructor consent	
MATH 2250 Elementary Linear Algebra	MATH 2200	
MATH 3310 Applied Differential Equations II	MATH 2210, MATH 2310	
MATH 4440 Introduction to Partial Differential Equations I	MATH 2210, MATH 2310	
STAT 4220 Basic Engineering Statistics	MATH 2205	
CHE 5000+ Any Chemical Engineering class at the graduate level		See catalog

Materials Science and Engineering

Select courses from the following list, including 9 credits of Chemical Engineering electives:

	Prerequisites
CHE 3900 Undergraduate Research (up to 6 credits)	Instructor consent
CHE 4165 Biomaterials	LIFE 1010, CHEM 1050
CHE 4170 Polymeric Materials Synthesis	CHEM 2440
CHE 4990 Polymer Chemistry and Engineering	See instructor
ME 3450 Properties of Materials	CHEM 1050, ES 2310
ES 2410 Mechanics of Materials	ES 2110, MATH 2205
EE/PHYS 4340 Semiconductor Materials and Devices	PHYS 1220
CHEM 4050 Solar Energy Conversion	CHEM 1060, PHYS 1210, MATH 2200

Petroleum Engineering

Take 9 credits of Chemical Engineering electives plus additional courses from the following list:

	Prerequisites
PETE 2050 Fundamentals of Petroleum Engineering	MATH 2205, PETE 1060
PETE 3200 Reservoir Engineering	PETE 2050
PETE 3255 Basic Drilling Engineering	PETE 2050
PETE 3715 Production Engineering	ES 2310, ES 2330, PETE 2050
PETE 4225 Well Testing	PETE 3200
PETE 4320 Well Log Interpretation	PETE 2050

Pre-Medicine and other Pre-Health Programs

Please see the Preprofessional Health Advising office for a list of courses.

Note: An area of emphasis is not a minor and will not be stated on your diploma.