

Chemical Engineering

Although chemical engineering has existed for only 100 years, its name is no longer completely descriptive of this dynamic profession. The work of the chemical engineer is not restricted to the chemical industry, chemical changes or chemistry. Instead, modern chemical engineers are concerned with all the physical, chemical and biological changes of matter that can produce an economic product or result that is useful to mankind.

About This Major

- **College:** Engineering
- **Degree:** Bachelor of Science in Chemical Engineering
- **Hours for the Degree:** 134
- **Minor:** No
- **Combined-Degree Program:** Yes
- undergraduate.che.ufl.edu/curriculum

Overview

The education of the chemical engineer is based on the fundamental sciences of physics, chemistry and biology, on mathematical and computer techniques, and on basic engineering principles. This background makes the chemical engineer extremely versatile and capable of working in a variety of industries: chemical, biochemical, petroleum, materials, microelectronics, environmental, food processing, consulting and project management. It is also good preparation for law and medical schools.

Department Requirements

Successful applicants must have earned a 2.5 grade point average or higher in the eight preprofessional courses and have earned a grade point average of 2.5 or higher in the preprofessional calculus course sequence. Transfer students and applicants from other universities must have earned an overall 3.0 GPA in addition to meeting previously stated requirements.

For the purposes of determining admission to or retention in the department, grade point averages will be based on the last of no more than two attempts for each course. Students must maintain satisfactory progress (GPA of 2.0 or higher) in chemical engineering courses and in their overall record.

To proceed to succeeding courses, C grades or better are required in ECH 3023, 3101, 3203, 3223, 3264 and COT 3502 within two enrollments (including withdrawals) for each course.

Any course taken to satisfy a degree requirement (general education, required course or technical elective) with the exception of ECH 4948 and 4949, cannot be taken with the S-U grade option.

Educational Objectives

Within a few years of obtaining a bachelor's degree in chemical engineering from the University of Florida, the recent graduate:

- Demonstrates professional engineering competence via promotions and/or positions of increasing responsibility, or successfully transitions from the traditional chemical engineering career path into business, government, education, etc.;
- Achieves and leads on-the-job safety and environmental protection;
- Contributes to achievement of organizational objectives with significant societal benefits;
- Publishes papers and/or internal reports, applies for patents, delivers conference presentations and/or contributes to innovative, state-of-the-industry articles; and
- Participates in life-long learning via progress toward or successful completion of an advanced degree, continuing education courses, professional engineering certification, professional development courses and/or industry training courses.

The chemical industry alone provides an opportunity for the chemical engineer to participate in the research, development, design or operation of plants for the production of new synthetic fibers, plastics, chemical fertilizers, vitamins, antibiotics, rocket fuels, nuclear fuels, paper pulp, photographic products, paints, fuel cells, semiconductors and the thousands of chemicals that are used as intermediates in the manufacture of these products.

Goal

To prepare students for life-long careers in chemical engineering.

Mission

To offer high-quality undergraduate and graduate degree programs in chemical engineering and to conduct research that helps educate graduate students and serves the needs of Florida and the nation.

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Critical Tracking

To graduate with this major, students must complete all university, college and major requirements.

Equivalent critical tracking courses as determined by the State of Florida Common Course Prerequisites may be used for transfer students.

Semester 1

- 2.0 UF GPA required for semesters 1-5
- 2.5 GPA on all critical tracking coursework for semesters 1-5
- Complete 1 of 8 critical tracking courses with a minimum grade of C within two attempts: CHM 2045 or CHM 2095, CHM 2046 or CHM 2096, MAC 2311, MAC 2312, MAC 2313, MAP 2302, PHY 2048, PHY 2049

Semester 2

- Complete 1 additional critical tracking course with a minimum grade of C within two attempts

Semester 3

- Complete 2 additional critical tracking courses with minimum grades of C within two attempts

Semester 4

- Complete 2 additional critical tracking courses with minimum grades of C within two attempts

Semester 5

- Complete all 8 critical tracking courses with minimum grades of C in each course within two attempts

Recommended Semester Plan

To remain on track, students must complete the appropriate critical tracking courses, which appear in bold.

Semester 1	Credits
If you do not place out of ENC 1101, take it in the fall.	
ABE 2062 Biology for Engineers or BSC 2011 Integrated Principles of Biology 2	3
CHM 2045 General Chemistry 1 (GE-P) or CHM 2095 Chemistry for Engineers 1 (GE-P)	3
CHM 2045L General Chemistry 1 Laboratory (GE-P)	1
MAC 2311 Analytic Geometry and Calculus 1 (GE-M)	4
Humanities (GE-H)	3
	Total 14
Semester 2	Credits
CHM 2046 General Chemistry 2 (GE-P) or CHM 2096 Chemistry for Engineers 2 (GE-P)	3
CHM 2046L General Chemistry 2 Laboratory (GE-P)	1
MAC 2312 Analytic Geometry and Calculus 2 (GE-M)	4
PHY 2048 Physics with Calculus 1 (GE-P)	3
PHY 2048L Physics with Calculus 1 Laboratory (GE-P)	1
Social and Behavioral Sciences (GE-S)	3
	Total 15
Semester 3	Credits
ECH 3023 Material and Energy Balances *	4
MAC 2313 Analytic Geometry and Calculus 3 (GE-M)	4
MAP 2302 Elementary Differential Equations (GE-M)	3
PHY 2049 Physics with Calculus 2 (GE-P)	3
PHY 2049L Physics with Calculus 2 Laboratory (GE-P)	1
	Total 15
Semester 4	Credits
CHM 4411 Physical Chemistry	4
COT 3502 Computer Model Formulation *	4
ECH 3264 Elementary Transport Phenomena *	3
ECH 4934 Professional Seminar	1
STA 3032 Engineering Statistics	3
	Total 15
Semester 5	Credits
CHM 2210 Organic Chemistry 1	3
ENC 3254 Professional Communication for Engineers (GE-C)	3
Humanities (GE-H)	3

Social and Behavioral Sciences (GE-S)	3
	Total 12
Semester 6	Credits
CHM 2211 Organic Chemistry 2	3
CHM 2211L Organic Chemistry 2 Laboratory	2
ECH 3101 Process Thermodynamics *	3
ECH 3203 Fluid and Solids Operations *	3
ECH 3223 Energy Transfer Operations *	3
	Total 14
Semester 7	Credits
CGN 3710 Experimentation and Instrumentation in Civil Engineering or EEL 3003 Elements of Electrical Engineering	3
ECH 4123 Phase and Chemical Equilibria	3
ECH 4224L Fluid and Energy Transfer Operations Laboratory ¹	2
ECH 4403 Separation and Mass Transfer Operations	3
ECH 4714L Safety and Experimental Evaluation	2
Technical elective	3
	Total 16
Semester 8	Credits
ECH 4404L Separation and Mass Transfer Operations Laboratory	2
ECH 4504 Chemical Kinetics and Reactor Design	4
ECH 4604 Process Economics and Optimization	3
ECH 4824 Materials of Chemical Engineering	2
Humanities (GE-H) or Social and Behavioral Sciences (GE-S)	3
Technical elective	3
	Total 17
Semester 9	Credits
CHM 3120 Introduction to Analytical Chemistry	3
ECH 4323 Process Control Theory	3
ECH 4323L Chemical Engineering Laboratory	1
ECH 4644 Process Design ²	3
Chemical engineering technical elective	3
Technical elective	3
	Total 16

Technical Electives

Technical electives are defined as department-approved, upper-division courses with significant science and/or math content. Provision is made to receive up to three credits of approved co-op, internship and/or research experience. Military courses cannot be used for technical electives.

* Must be completed with a grade of C or better.

¹ Students are strongly encouraged to register for ECH 4224L Fluid and Energy Transfer Operations Laboratory immediately following completion of ECH 3101, ECH 3203 and ECH 3223.

² The Integrated Product and Process Design program (ECH 4912 and ECH 4913) requires six hours of coursework and is offered as a sequence of two three-credit courses during fall and spring of the senior year. These two courses are pre-approved substitutes for three credits of technical electives and for ECH 4644 Process Design.

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