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 Program

• College: Herbert Wertheim College of Engineering
• Degree: Bachelor of Science in Chemical Engineering
• Credits for Degree: 134

Additional Information

• Related Chemical Engineering Programs

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

Critical Tracking records each student’s progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

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

Semester 1

• 2.5 GPA in MAC 2311, MAC 2312 and MAC 2313 sequence based on the best of two attempts
• 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
• 2.5 GPA required for all critical-tracking courses based on the best of two attempts
• 2.0 UF GPA required

Semester 2

• Complete 1 additional critical-tracking course with a minimum grade of C within two attempts
• 2.5 GPA required for all critical-tracking courses based on the best of two attempts
• 2.5 GPA in MAC 2311, MAC 2312 and MAC 2313 sequence based on the best of two attempts
• 2.0 UF GPA required

Semester 3

• Complete 2 additional critical-tracking courses with minimum grades of C within two attempts
• 2.5 GPA required for all critical-tracking courses based on the best of two attempts
• 2.5 GPA in MAC 2311, MAC 2312 and MAC 2313 sequence based on the best of two attempts
• 2.0 UF GPA required

Semester 4

• Complete 2 additional critical-tracking courses with minimum grades of C within two attempts
• 2.5 GPA in MAC 2311, MAC 2312 and MAC 2313 sequence based on the best of two attempts
• 2.5 GPA required for all critical-tracking courses based on the best of two attempts
• 2.0 UF GPA required

Semester 5

• Complete all 8 critical-tracking courses with minimum grades of C in each course within two attempts and a 2.5 GPA on all critical-tracking courses based on the best of two attempts.
• 2.5 GPA in MAC 2311, MAC 2312 and MAC 2313 sequence based on the best of two attempts
• 2.5 GPA required for all critical-tracking courses based on the best of two attempts
• 2.0 UF GPA required

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student’s academic record and scheduling availability of courses. Prerequisites still apply.

Course | Title | Credits
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ABE 2062 or BSC 2010 | Biology for Engineers or Integrated Principles of Biology 1 | 3
Select one: CHM 2045 or CHM 2095 | General Chemistry 1 (Critical Tracking; State Core Gen Ed Physical Sciences) | 3
CHM 2095 | Chemistry for Engineers 1 (Critical Tracking; State Core Gen Ed Physical Sciences) | 3
CHM 2045L | General Chemistry 1 Laboratory (Gen Ed Physical Sciences) | 1
IUF 1000 | What is the Good Life (Gen Ed Humanities) | 3
MAC 2311 | Analytic Geometry and Calculus 1 (Critical Tracking; State Core Gen Ed Mathematics) | 4

Credits | 14

Semester Two

Select one: CHM 2046 or CHM 2096 | General Chemistry 2 (Critical Tracking; State Core Gen Ed Biological and Physical Sciences) | 3
CHM 2096 | Chemistry for Engineers 2 (Critical Tracking; State Core Gen Ed Biological and Physical Sciences) | 3
CHM 2046L | General Chemistry 2 Laboratory (Gen Ed Physical Sciences) | 1
ENC 1101 | Expository and Argumentative Writing (State Core Gen Ed Composition) | 3
MAC 2312 | Analytic Geometry and Calculus 2 (Critical Tracking; Gen Ed Mathematics) | 4
PHY 2048 | Physics with Calculus 1 (Critical Tracking; Gen Ed Physical Sciences) | 3
PHY 2048L Laboratory for Physics with Calculus 1 (Gen Ed Physical Sciences) 1

Semester Three
ECH 3023 Material and Energy Balances 1 4
MAC 2313 Analytic Geometry and Calculus 3 (Critical Tracking) 4
MAP 2302 Elementary Differential Equations (Critical Tracking) 3
PHY 2049 Physics with Calculus 2 (Critical Tracking; Gen Ed Physical Sciences) 3
PHY 2049L Laboratory for Physics with Calculus 2 (Gen Ed Physical Sciences) 1

Credits 15

Semester Four
CHM 4411 or PHY 3513 Physical Chemistry - Thermodynamics and Kinetics 5 or Thermal Physics 1 3-4
COT 3502 Computer Model Formulation 1 4
ECH 3264 Elementary Transport Phenomena 1 3
ECH 4934 Professional Seminar 1
STA 3032 Engineering Statistics 3

Credits 15

Semester Five
CHM 2210 Organic Chemistry 1 3
ENC 3246 Professional Communication for Engineers (Gen Ed Composition) 3
State Core Gen Ed Humanities 2 3
State Core Gen Ed Social and Behavioral Sciences 2 3

Credits 12

Semester Six
CHM 2211 & 2211L Organic Chemistry 2 and Organic Chemistry Laboratory 5
ECH 3101 Process Thermodynamics 1 3
ECH 3203 Fluid and Solid Operations 1 3
ECH 3223 Energy Transfer Operations 1 3

Credits 14

Semester Seven
ECH 4123 Phase and Chemical Equilibria 3
ECH 4224L Fluid and Energy Transfer Operations Laboratory 3
ECH 4403 Separation and Mass Transfer Operations 3
ECH 4714 Chemical Process Safety 3
Gen Ed Social and Behavioral Sciences 2 3
Technical elective 3

Credits 17

Semester Eight
CGN 3710 or EEL 3003 Experimentation and Instrumentation in Civil Engineering or Elements of Electrical Engineering 3
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
Technical elective 3

Credits 17

Semester Nine
CHM 3120 Introduction to Analytical Chemistry 3
ECH 4323 Process Control Theory 4

ECH 4644 Process Design 4 3
Chemical engineering technical elective 3
Technical elective 3

Credits 16

Total Credits 134

1 Minimum grade of C required.
2 Students are also expected to complete the general education international (GE-N) and diversity (GE-D) requirements. This is often done concurrently with another general education requirement (typically, GE-C, H or S).
3 Register for ECH 4224L immediately following completion of ECH 3101, ECH 3203 and ECH 3223.
4 The Integrated Product and Process Design program (ECH 4912 and ECH 4913) requires six credits 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.
5 If the Physical Chemistry Topics 3 credit requirement is satisfied by a 4 credit class, the additional credit satisfies 1 credit of the Technical elective requirement.

Most students will have credit for research or industry experiential education during the previous summer.

Technical Electives
Technical electives are defined as department-approved, upper-division courses with significant technical science, engineering, and/or math content. Provision is made to receive up to five credits of approved co-op, internship and/or research experience with no more than three credits coming from industry work and no more than three coming from academic research. Military courses cannot be used for technical electives.

The chemical engineering program enables students to apply knowledge of mathematics, science and engineering principles to chemical engineering problems; to design and conduct chemical engineering experiments and to analyze and interpret the data; to design a chemical engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints; and to communicate technical data and design information effectively in speech and in writing to other chemical engineers.

Accredited by the Engineering Accreditation Commission of ABET.

Before Graduating Students Must
- Pass an assessment by two or more faculty and/or industry practitioners of performance on a major design experience.
- Pass assessment in two courses of individual assignments targeted to each learning outcome. Assessment will be provided by the instructor of the course according to department standards.
- Complete an exit interview in your final semester.
- Complete requirements for the baccalaureate degree, as determined by faculty.
Students in the Major Will Learn to
Student Learning Outcomes (SLOs)

Content
1. Apply knowledge of mathematics, science and engineering principles to chemical engineering problems.
2. Design and conduct chemical engineering experiments and analyze and interpret the data.

Critical Thinking
3. Design a chemical engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints.

Communication
4. Communicate technical data and design information effectively in writing and in speech to other chemical engineers.

Curriculum Map

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Assessment Types

- Exams
- Oral and written reports
- Group presentations
- Co-op and internship employer evaluations
- Additional assessments include the student survey and exit interview