

CHEMICAL ENGINEERING

Program Information

The Chemical Engineering Department offers the degrees of Doctor of Philosophy, Master of Science (thesis and non-thesis options), and Master of Engineering in Chemical Engineering. Minimum requirements for these degrees are given in the Graduate Degrees (<http://gradcatalog.ufl.edu/graduate/degrees/>) section of this catalog.

Master of Science Degree – Thesis Option

Completion of the program is possible in 16 months, and its usual duration ranges from 16 to 24 months. The principal requirements for the M.S. degree are 30 semester hours and a research thesis approved by the student's supervisory committee. These credits include:

- Twelve graduate semester hours in the basis of chemical engineering courses (Mathematical Basis, Continuum Basis, Molecular Basis, and Chemical and Bio Lab). Molecular Basis can be replaced with an Elective for students on Applied Track.
- Six credits of Chemical Engineering Science courses, including at least one course in reaction engineering, bioengineering, or kinetics.
- Up to six semester hours of supervised research.

Students must submit a final thesis and pass an oral thesis-defense examination.

Master of Science Degree – Non-Thesis Option

This program is designed for completion in 12 months, although some students prefer longer durations. The M.S.-Non-Thesis provides an opportunity to develop an in-depth knowledge of chemical engineering fundamentals, to emphasize a specific specialization area, and to acquire basic experience in research or industrial practice through a short internship. The principal requirements are 30 credits of courses including an option for 7 credits of research work in a laboratory or of work in an industrial internship. The core course requirements for this program are identical to that for the M.S.-Thesis. A final thesis document is not required but a written report on a project, internship or a contemporary Chemical Engineering topic is required for graduation.

All new students for the M.S. program are admitted to the non-thesis option at the time of admission, and some are converted to the thesis option upon approval by the Research Advisor and the Director of Graduate Programs.

Master of Engineering Degree

A student with a B.S. degree in biology, chemistry, physics, mathematics, or another branch of engineering may obtain a graduate degree in Chemical Engineering by meeting the necessary academic requirements and taking selected undergraduate courses. Students intending to obtain a professionally oriented M.E. degree would normally complete their undergraduate requirements in 1-2 semesters. The graduate course requirements of 30 credits of coursework require another 3-4 semesters. The M.E. students can apply for conversion to the M.S.-NT or M.S.-Thesis program after satisfactory completion of the undergraduate courses.

Ph.D. Degree

The Ph.D. degree plan is primarily a research program. The granting of the degree is based essentially on general proficiency and distinctive attainments in Chemical Engineering and particularly on the demonstrated ability to conduct an independent investigation as

exhibited in the doctoral dissertation. Briefly, the formal requirements for the Ph.D. degree are:

- Maintaining a GPA of 3.0 or higher with B- or higher in all Basis courses.
- Successful completion of written and oral examinations for advancement to candidacy. The written examination is comprised of the candidate's objectives and achievements towards their doctoral dissertation. The oral examination is based on the written part and related areas. The oral section also includes the Qualifying Examination to test the student's breadth of knowledge in Chemical Engineering fundamentals.
- Preparing a dissertation based on original research.
- Passing the final examination based on the dissertation.
- The graduation requirements include 90 credits including at least 30 credits in coursework. Details and minor changes in any of these requirements will be given upon the student's arrival.

The department offers a combination bachelor's/master's degree program. Contact graduate coordinator for information.

For more information, please see our website: <https://www.che.ufl.edu/apply-to-che/#1518393029582-95412685-f4f2>.

Degrees Offered

Degrees Offered with a Major in Chemical Engineering

- Doctor of Philosophy
- Master of Engineering
- Master of Science

Requirements for these degrees are given in the Graduate Degrees (<http://gradcatalog.ufl.edu/graduate/degrees/>) section of this catalog.

Courses

Chemical Engineering Departmental Courses

Code	Title	Credits
BME 6221	Biomolecular Cell Mechanics	3
BME 6322	Dynamics of Cellular Processes	3
BME 6644	Pharmacokinetics	3
CHM 5275	The Organic Chemistry of Polymers	2
CHM 5511	Physical Chemistry of Polymers	2
ECH 5938	Topics in Colloid Science	3
ECH 6052	Research Methods in Chemical Engineering	1
ECH 6126	Thermodynamics of Reaction and Phase Equilibria	3
ECH 6225	Electron Transport Phenomena in Semiconductors	3
ECH 6270	Continuum Basis of Chemical Engineering	3
ECH 6272	Molecular Thermodynamics of Chemical Engineering	3
ECH 6275	Nanoscale Transport	3
ECH 6285	Transport Phenomena	3
ECH 6326	Computer Control of Processes	3
ECH 6506	Chemical Engineering Kinetics	3
ECH 6526	Reactor Design and Optimization	3
ECH 6537	Molecular Understanding of Catalysis	3

ECH 6538	Surface Science	3
ECH 6709	Electrochemical Engineering Fundamentals and Design	3
ECH 6716	Managing Safety in the Chemical Industry	3
ECH 6726	Interfacial Phenomena I	3
ECH 6727	Interfacial Phenomena II	3
ECH 6728	Material Self-Assembly Over All Length Scales	3
ECH 6828	Polymer Science & Engineering for Chemical Engineers	3
ECH 6829	Polymer Processing	3
ECH 6836	Semiconductor Device Fabrication Principles for Chemical Engineers	3
ECH 6837	Complex Fluids	3
ECH 6843	Design and Analysis of Chemical Engineering Experiments	3
ECH 6845	Chemical Process Data Science	3
ECH 6847	Advanced Mathematics for Chemical Engineering	3
ECH 6851	Impedance Spectroscopy	3
ECH 6905	Individual Work	1-6
ECH 6910	Supervised Research	1-5
ECH 6926	Graduate Seminar	1
ECH 6937	Topics in Chemical Engineering I	1-4
ECH 6939	Topics in Chemical Engineering III	1-4
ECH 6940	Supervised Teaching	1-5
ECH 6971	Research for Master's Thesis	1-15
ECH 7938	Advanced Special Chemical Engineering Topics for Doctoral Candidates	1-4
ECH 7979	Advanced Research	1-12
ECH 7980	Research for Doctoral Dissertation	1-15
EGN 5949	Practicum/Internship/Cooperative Work Experience	1-6
EGN 6640	Entrepreneurship for Engineers	3
EGN 6913	Engineering Graduate Research	0-3
EGS 6054	Cognition, Learning, and Pedagogy in Engineering Education	3
EGS 6056	Learning and Teaching in Engineering	1
EGS 6085	Advanced Engineering Educational Technology	3
EGS 6101	Divergent Thinking	3
EGS 6626	Fundamentals of Engineering Project Management	3
EGS 6628	Advanced Practices in Engineering Project Management	3
EGS 6629	Agile Project Management for Engineers and Scientists	3
EGS 6681	Advanced Engineering Leadership	3
EGS 6930	Engineering Education Seminar	1
EGS 6940	Preparation for Engineering Education Practicum	1
EGS 6949	Research to Practice Experience in Engineering Education	1-3
EGS 6971	Research for Master's Thesis	1-12
EGS 7979	Advanced Research	1-12
EGS 7980	Research for Doctoral Dissertation	1-12
ESI 6900	Principles of Engineering Practice	1-4

Student Learning Outcomes

Chemical engineering (phd)

SLO 1 Knowledge

a. Ability to identify a problem b. Ability to formulate a problem
c. Ability to solve engineering problems d. Ability to critically read engineering literature

SLO 2 Skills

Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice at an advanced level

SLO 3 Professional Behavior

Ability to communicate effectively

Chemical Engineering (ME & MS)

SLO 1 Knowledge

a. Ability to identify a problem b. Ability to formulate a problem
c. Ability to solve engineering problems d. Ability to critically read engineering literature

SLO 2 Skills

Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice at an advanced level

SLO 3 Professional Behavior

Ability to communicate effectively

College of Engineering Courses

Code	Title	Credits
EEE 5354L	Semiconductor Device Fabrication Laboratory	3
EEE 5776	Applied Machine Learning	3
EEE 6778	Applied Machine Learning II	3
EGN 5215	Machine Learning Applications in Civil Engineering	3
EGN 5216	Machine Learning for Artificial Intelligence Systems	3
EGN 5442	Programming for Applied Data Science	3
EGN 6216	Artificial Intelligence Systems	3
EGN 6217	Applied Deep Learning	3
EGN 6446	Mathematical Foundations for Applied Data Science	3
EGN 6640	Entrepreneurship for Engineers	3
EGN 6642	Engineering Innovation	3
EGN 6913	Engineering Graduate Research	0-3
EGN 6933	Special Topics	1-3
EGN 6937	Engineering Fellowship Preparation	0-1
EGS 6012	Research Methods in Engineering Education	3
EGS 6020	Research Design in Engineering Education	3
EGS 6039	Engineering Leadership	3
EGS 6050	Foundations in Engineering Education	3
EGS 6051	Instructional Design in Engineering Education	3