Chemical Engineering

Degrees: BS, MS, PhD
Areas of Emphasis: Biochemical Engineering
Average Starting Salary with BS: $66,531

Chemical engineering is the branch of engineering that deals with changing the composition, energy content and state of aggregation of materials. As a chemical engineer you will consider the fundamental properties and nature of matter, the forces that act on matter and the precise expressions of the relationships between them.

You may study ways in which pure water can be obtained from the sea; design processes to provide fertilizers, rubber, fibers and fuels; or team up with other engineers and scientists in biomedical engineering to develop specialized polymeric materials for use in artificial limbs and other human organs. You may be instrumental in finding supplemental food sources. You might help develop new processes for the application of biochemistry, energy conservation or environmental controls. You may even have a hand in the creation of strong lightweight materials to be used in aircraft.

Chemical Engineering prepares students for careers in manufacturing, petrochemicals, biotechnology, research and development of novel biomaterials, plasma technology as applied to biomedical applications, medicinal chemical engineering, environmental biotechnology, design and development of materials for personal care products.

Research Opportunities

Undergraduate research opportunities are available through the OURE program as well as many faculty-sponsored projects. The chemical engineering, biological sciences and chemistry departments are located in the same building. Many current research projects involve faculty members from multiple disciplines. This provides undergraduates with interdisciplinary interests an excellent opportunity to do research in these areas while working on a degree in chemical engineering.

Departmental Contact Information:

Department Chair: Dr. Muthanna H. Al-Dahhan
573-341-4416 143 Schrenk Hall
chemeng.mst.edu chemeng@mst.edu

Student Organizations

There is a very active student chapter of the American Institute of Chemical Engineers. Students in the department are also involved in Omega Chi Epsilon, the chemical engineering honor society. Many students also participate in Tau Beta Pi—the engineering honor society—and Alpha Chi Sigma—a service society for students in chemical related fields.

Cooperative and Internship Education Program

Co-op and summer intern programs are available to students. These programs provide students with the opportunity to integrate their classroom studies with learning through productive work experiences in a field related to their academic or career goals. Work for a semester or during the summer and build your resume.

Top Hiring Employers

ExxonMobil	Dow Chemical
Anheuser Busch	Northrup Grumman
Cargill	The Solae Companies
General Motors	Proctor & Gamble
DuPont	BASF
3M	Government & Military Employers

Scholarship Information

Freshman scholarships are available through the department. Scholarships ranging from $500 to $6,000 for sophomores, juniors and seniors typically require an application and are based on academic record, service activities and extracurricular activities. One-third of chemical engineering students receive departmental scholarship support.

James E. Bertelsmeyer Hall

In the fall of 2014 a new $22.3mil chemical and biochemical engineering building will open at Missouri S&T.

Faculty

Professors:
- Muthanna Al-Dahhan, Washington University (Chair)
- Daniel Forciniti, Ph.D., North Carolina State
- Athanasios Liapis, Ph.D., Swiss Federal Institute of Technology
- Douglas Ludlow, Ph.D., Arizona State
- Parthasakha Neogi, Ph.D., Carnegie Mellon
- Sunggyu "KB" Lee, Ph.D., Case Western Reserve
- Joseph Smith, Ph.D., Bringham Young

Associate Professors:
- Oliver Sitton, Ph.D., Missouri S&T
- Jee-Ching Wang, Ph.D., Maryland
- Yangchuan Xing, Ph.D., Yale
- David Westenberg, Ph.D., Michigan State

Assistant Professors:
- Xinhua Liang, Ph.D., Colorado

Emeritus Faculty:
- Neil Book, Ph.D., Colorado
- Orrin Crosser, Ph.D., Rice
- David Manley, Ph.D., Kansas
- Nicholas Morosoff, Ph.D., NYU-Poly
- Gary Patterson, Ph.D., Missouri S&T
- Stephen Rosen, Ph.D., Cornell

Registered Professional Engineer

Minor Programs and Emphasis Areas

A minor in chemical engineering or an emphasis in biochemical engineering are available. Requirements are outlined in S&T's course catalog, available online at **registrar.mst.edu**. Related degree programs and minors at Missouri S&T:

- Bachelor of Science, Chemical Engineering w/ emphasis in Biochemical Engineering
- Bachelor of Science, Chemistry
- Bachelor of Science, Chemistry w/ Biochemistry emphasis
- Bachelor of Science, Chemistry w/ Pre-Med emphasis
- Bachelor of Science, Chemistry w/ Polymers & Coatings Science emphasis
- Bachelor of Arts, Chemistry
- Bachelor of Science, Biological Sciences
- Bachelor of Arts, Biological Sciences
- Minor, Chemical Engineering
- Minor, Chemistry
- Minor, Bioinformatics
- Minor, Pre-Med

Notes

Detailed information on course equivalencies, acceptable credits for elective coursework, grade requirements and prerequisites is available from S&T's Registrar's Office at **registrar.mst.edu**.

All chemical engineering students must take the Fundamentals of Engineering Examination prior to graduation. A passing grade is not required, however, this is the first step to becoming a registered professional engineer.

Bachelor of Science

Chemical Engineering ..... 128 credit hours

Entering freshmen desiring to study Chemical Engineering are admitted to the Freshman Engineering Program. They may, however, state a Chemical Engineering preference, which will be used as a consideration for available freshman departmental scholarships. The focus of the Freshmen Engineering program is on enhanced advising and career counseling, with the goal of providing to the student the information necessary to make an informed career decision.

FIRST YEAR — Credit

Chemistry 1310, 1319-General Chemistry I w/ Lab	5
Chemistry 1100-General Chemistry II	3
English 1120-Exposition	3
Math 1214-Calculus for Engineers I	4
Math 1215-Calculus for Engineers II	4
Physics 1135-Engineering Physics I	4
FE 1100-Careers in Engineering	1
MechE 1720-Engineering Design	3
ChemE 1100-Computers and Chemical Engineering	3
History 1200, 1300, 1310 -or- Pol Sci 1200	3
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SECOND YEAR

ChemE 2100-Chemical Materials	3
ChemE 2310-Professional Practices & Ethics	1
ChemE 2110-Thermodynamics I	3
ChemE 2300-Chemical Processes	3
Chemistry 2210-Organic Chemistry I	3
Math 2222-Calculus III/Analytic Geometry	4
Math 3304-Elementary Differential Equations	3
Physics 2135-Engineering Physics II	4
Econ 1100 or 1200-Micro or Macroeconomics	3
Elective/Humanities or Social Science	3
Elective/Humanities or Social Science	3
	33

THIRD YEAR

ChemE 3100-Fluid Flow	3
ChemE 3110-Heat Transfer	2
ChemE 4100-Chem Eng Lab I	2
ChemE 3130-Staged Mass Transfer	3
ChemE 3140-Cont Mass Transfer	3
ChemE 3120-Theromodynaics II	3
ChemE 3160-Molecular Chemical Engineering	3
Chemistry 3410-Physical Chemistry I	3
Chemistry Elective w/ Lab	4
Elective/Humanities or Social Science	3
Elective/Humanities or Social Science	3
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FOURTH YEAR

ChemE 4130-Chem Engineering Lab II	3
ChemE 4110, 4120-Process Dynamics & Controls w/ Lab	4
ChemE 3150-Reactor Design	3
ChemE 4096-Chem Engr Economics	2
ChemE 4140-Process Safety	3
ChemE 4097-Process Design	3
ChemE Elective	3
ChemE Elective	3
Elective/Free	3
Elective/Free	3
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