BS in Chemical Engineering

Degree Program Description

The curriculum provides a well-rounded general education and rigorous technical education in order to hone an appreciation of the relationship between technology and society. The technical curriculum focuses on the basic sciences, as well as chemical engineering theory and practice. Throughout the curriculum, problem solving, design, critical thinking, and teamwork skills are built by integrating team-based design projects, laboratories, and reports. Our graduates work in traditional chemical engineering areas such as the petroleum and chemical industries, as well as microelectronics, pharmaceuticals, materials, polymers, environmental protection, consumer products, and engineering consulting. Our graduates also pursue careers in business management or government as well as advanced studies in medicine, law, business, basic sciences, and other engineering disciplines.

Major Program Requirements

Each graduate must complete the required curriculum designed to demonstrate knowledge and integration of chemical engineering science and practice using analytical, computational, and experimental techniques. Students are also required to complete one cultural awareness course which is selected from an approved list, created and maintained by the College of Engineering or which meets the Arts and Science (A&S) diversity requirement. In addition, each graduate must have a detailed working knowledge of the entire spectrum of chemical engineering activities.

All requirements listed below are in addition to University requirements. Students may also add an emphasis in the university requirements. All requirements listed below are in addition to University requirements, including University general education (http://catalog.missouri.edu/academicdegreerequirements/generaleducationrequirements/), including University general education and University graduation (http://catalog.missouri.edu/academicdegreerequirements/), and College of Engineering requirements. Students may also add an emphasis in the Biochemical (http://catalog.missouri.edu/collegefengineering/chemicalengineering/bs-chemical-engineering-emphasis-biochemical/), Environmental (http://catalog.missouri.edu/collegefengineering/chemicalengineering/bs-chemical-engineering-emphasis-environmental/), or Materials (http://catalog.missouri.edu/collegefengineering/chemicalengineering/bs-chemical-engineering-emphasis-materials/) areas by completing that emphasis area’s requirements.

Major core requirements

| Required entry-level courses |  |
|-----------------------------|  |
| MATH 1500 | Analytic Geometry and Calculus I | 5 |
| MATH 1700 | Calculus I | 5 |
| MATH 2300 | Calculus II | 3 |
| MATH 4100 | Differential Equations | 3 |
| PHYSCS 2750 | University Physics I | 5 |
| PHYSCS 2760 | University Physics II | 5 |
| CHEM 1320 | College Chemistry I | 4 |
| CHEM 1330 | College Chemistry II | 4 |
| CHEM 2100 | Organic Chemistry I | 3 |
| CHEM 2110 | Organic Chemistry II | 3 |
| CHEM 2130 | Organic Laboratory I | 3 |
| STAT 4710 | Introduction to Mathematical Statistics | 3 |

| Chemical engineering core |  |
|---------------------------|  |
| CH_ENG 1000 | Introduction to Chemical Engineering | 2 |
| CH_ENG 2225 | Mass and Energy Balance | 3 |
| CH_ENG 2226 | Engineering Process Computations | 3 |
| CH_ENG 3233 | Chemical Engineering Fluid Dynamics | 3 |
| CH_ENG 3234 | Heat and Mass Transfer | 3 |
| CH_ENG 3235 | Separation Processes | 3 |
| CH_ENG 3243 | Chemical Engineering Laboratory I \(^{a}\) | 3 |
| or CH_ENG 3243W | Chemical Engineering Laboratory I - Writing Intensive | 3 |
| CH_ENG 3261 | Chemical Engineering Thermodynamics I | 3 |
| CH_ENG 3262 | Chemical Engineering Thermodynamics II | 3 |
| CH_ENG 4363 | Chemical Reaction Engineering and Technology | 3 |
| CH_ENG 4370 | Process Dynamics and Control \(^{c}\) | 3 |
| CH_ENG 4385 | Chemical Engineering Design I | 3 |
| CH_ENG 4980 | Process Synthesis and Design \(^{a, b}\) | 3 |
| or CH_ENG 4980W | Process Synthesis and Design - Writing Intensive | 3 |

Additional requirements

| Chemical engineering electives | 9 |
| Engineering technical elective | 3 |
| Humanities | 9 |
| Social/behavioral sciences | 6 |
| 2000 level or greater course in humanities or social/behavioral sciences as part of 18 CR of humanities and social sciences |  |
| Economics elective from approved list | 3 |
| Chemistry elective from approved list | 3 |
| One technical elective \(^{c}\) | 3 |
| One general elective | 3 |

\(^{a}\) Writing-intensive

\(^{b}\) Satisfies capstone requirement

\(^{c}\) MATH 4140 is recommended for CH_ENG 4370

Approved Economics Electives

| ABM 1041 | Applied Microeconomics | 3 |
| ABM 1042 | Applied Macroeconomics | 3 |
| ECONOM 1014 | Principles of Microeconomics | 3 |
| ECONOM 1015 | Principles of Macroeconomics | 3 |
| IMSE 2710 | Engineering Economic Decision-Making | 3 |

Approved Chemistry Electives

| BIOCHM 3630 | General Biochemistry | 3 |
| BIOCHM 4270 | Biochemistry (I) | 3 |
| BIOCHM 4272 | Biochemistry (II) | 3 |
| CHEM 3200 | Quantitative Methods of Analysis with Lab | 4 |
| CHEM 4330 | Physical Chemistry II | 3 |
| CHEM 4340 | Physical Chemistry Laboratory | 3 |
| CHEM 4010 | Advanced Chemistry Laboratory | 3 |
| CHEM 4200 | Instrumental Methods of Analysis with Lab | 3 |
| CHEM 4160 | Intermediate Organic Chemistry | 3 |
| CHEM 4170 | Medicinal Chemistry | 3 |
| CHEM 4280 | Environmental Chemistry | 3 |
| CHEM 4400 | Inorganic Chemistry | 3 |
CHEM 4490  Physics and Chemistry of Materials  a  3
CHEM 4600  Introduction to Radiochemistry with Lab  3

a CHEM 4490 is the same as BIOL_EN 4480, BME 4480,
NU_ENG 4319, and PHYSICS 4190.

**Semester Plan**

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

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**Total Credits:** 125