Bachelor of Science in Chemical Engineering (B.S.Ch.E.)

Concentration: Materials Processing

Department of Chemical & Biological Engineering

Catalog Year: 2015-2016

Fall Semester

Freshman Year

CBE 101  Introduction to Chemical Engineering and Biological Engineering  1
CHEM 121  General Chemistry I  3
CHEM 123L  General Chemistry I Laboratory  1
ENGL 110  Accelerated Composition (or Composition II or Enhanced Composition)  3
MATH 162  Calculus I(1)  4
Core Humanities Elective(3)  3

Total Semester Hours: 15

Spring Semester

CHEM 122  General Chemistry II  3
CHEM 124L  General Chemistry II Laboratory  1
ENGL 120  Composition III  3
MATH 163  Calculus II(1)  4
PHYS 160  General Physics(1)  3
Core Social and Behavioral Science Elective(3)  3

Total Semester Hours: 17

Sophomore Year

Fall Semester

CBE 251  Chemical Process Calculations(1)  3
CHEM 301  Organic Chemistry  3
CHEM 303L  Organic Chemistry Laboratory  1
MATH 264  Calculus III(1)  4
PHYS 161  General Physics(1)  3

Total Semester Hours: 14

Spring Semester

CBE 253  Chemical Process Calculations II(1)  3
CHEM 302  Chemical Engineering Thermodynamics(1)  3
ECON 105  Introductory Macroeconomics(4)  3
MATH 316  Applied Ordinary Differential Equations(1)  3
Core Second Language Elective(3)  3

Total Semester Hours: 15

Junior Year

Fall Semester

CBE/NE 311  Introduction to Transport Phenomena(1)  3
CBE 317  Numerical Methods for Chemical and Biological Engineering(1)  2
CBE 318L  Chemical Engineering Laboratory I(1)  1
CBE 361  Biomolecular Engineering  3
ENGL 219  Technical and Professional Writing  3
CHEM 311  Physical Chemistry  3

Total Semester Hours: 15

Spring Semester

CBE/NE 312  Unit Operations(1)  3
CBE 320  Mass Transfer(1)  3
CBE 319L  Chemical Engineering Laboratory II(1)  1
CBE 371  Introduction to Materials Engineering  3
ENG 301  Fundamentals of Engineering: Dynamics  1
ENG 302  Fundamentals of Engineering: Electronic Circuits  1
CHEM 312  Physical Chemistry  3

Total Semester Hours: 15

Senior Year

Fall Semester

CBE 418L  Chemical Engineering Laboratory III(1)  1
CBE 454  Process Dynamic and Control(1)  3
CBE 461  Chemical Reactor Engineering(1)  3
CBE 486  Introduction to Statistics and Design of Experiments(1)  2
CBE 493L  Chemical Engineering Design(1)  3
CHEM 431, 471 or 471  Advanced Inorganic Chemistry, Adv T: Polymer Science, or Adv T: Chemistry and Physics at the Nanoscale  3

Total Semester Hours: 15

Spring Semester

CBE 419L  Chemical Engineering Laboratory IV(1)  1
CBE 451  Senior Seminar(1)  1
CBE 494L  Advanced Chemical Engineering Design(1)  3
Technical Elective(6)  3
Technical Elective - Engineering(6)  3
Core Fine Arts Elective(3)  3
Core Humanities Elective(3)  3

Total Semester Hours: 17

(1) Only courses with grades of "C-" or better may be applied toward the B.S.Ch.E. Courses with this footnote are prerequisites for other classes, and must be taken in the sequence listed. CBE classes are generally only offered in the semester listed, hence skipping a core CBE class could delay graduation by one year. Students are encouraged to sign up for independent study, CBE 491/492 which provide academic credit for doing research under the supervision of a CBE faculty member.

(2) Students must file an application for the B.S.Ch.E. degree prior to the completion of 95 credit hours of applicable courses.

(3) Students should consult with advisors to obtain a list of acceptable core humanities, social/behavioral science, fine arts and second language electives. These courses may be taken whenever convenient. Grade must be "C" or better.

(4) ECON 105 may be taken in either the sophomore or junior year.

(5) A minimum of 9 credit hours of advanced chemistry and/or biology courses. CHEM **312 is required for all concentrations. For the other classes, select from among CHEM **302, **311, **431; Chemistry and Physics at the Nanoscale; BIOL 201; or other approved courses, depending upon the student’s area of concentration. The courses chosen must represent a logical sequence of courses for the concentration and must be approved by an academic advisor.

(6) Technical electives are chosen from upper-division courses approved by the chemical engineering program advisors. A list of approved technical electives is available on the Department Web site. One of these electives must be a class taught from within the School of Engineering, and the other elective may be taught from within either the School of Engineering or the College of Arts and Sciences. The department requires that these courses be part of an approved concentration. The chairperson may allow up to 6 credit hours of technical electives for students taking required ROTC courses in aerospace or naval science. One technical elective can be replaced by a research project done under the supervision of a CBE faculty member and requires advance approval by the undergraduate advisor.

(7) Students are encouraged to take the Fundamentals of Engineering (FE) Examination during their senior year. This is the first formal step toward professional registration.