ENGR Courses

ENGR 101. Engineering Student Success. 1 unit
CR/NC
Term Typically Offered: F
Strategies for success as an engineering student, including development of intrinsic motivation, time management, self-advocacy, campus resources, and career preparation. Engineering design process, teamwork, and communication skills. Credit/No Credit grading only. 1 activity.

ENGR 110. Engineering Science I. 2 units
Term Typically Offered: F
Introduction to engineering and computer science. Graphical communication and visualization as well as engineering orientation. Cultural pluralism and gender issues. 2 lectures.

ENGR 111. Engineering Science II. 3 units
Term Typically Offered: W
Introduction to engineering and computer science. Computer-aided design (CAD) and manufacturing (CAM), and fabrication, as well as engineering orientation. Cultural pluralism and gender issues. 3 lectures.

ENGR 270. Selected Topics. 1-4 units
Term Typically Offered: TBD
Prerequisite: Open to undergraduate students and consent of instructor.
Directed group study of selected topics. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1 to 4 lectures.

ENGR 302. Transportation and Manufacturing in the Twenty-First Century. 4 units
GE Area F
Term Typically Offered: W, SP
Prerequisite: Junior standing and completion of GE Area B, or consent of instructor.
Role of transportation and manufacturing technology in the twenty-first century. Effects of technological change upon society, and the principles associated with the advancement of transportation and manufacturing technologies in the automotive industry and the industrial-military complex. Case studies of systems to compare alternative approaches to problem solving. 4 lectures. Fulfills GE Area F.

ENGR 350. The Global Environment. 4 units
GE Area F
Term Typically Offered: TBD
Prerequisite: Junior standing and completion of GE Areas A and B.
Interdisciplinary investigation of how human activities impact the Earth’s environment on a global scale. Examination of population, resource use, climate change, and biodiversity from scientific/technical and social/economic/historical/political perspectives. Use of remote sensing maps. Sustainable solutions. 4 lectures. Crosslisted as AG/EDES/ENGR/ISLA/SCM/UNIV 350. Fulfills GE Area F.

ENGR 400. Special Problems for Advanced Undergraduates. 2-4 units
Term Typically Offered: F,W,SP,SU
Prerequisite: ME 212 or consent of department head.
Individual investigation, research, studies or surveys of selected problems. Total credit limited to 4 units.

ENGR 451. Special Topics in Bioengineering. 4 units
Term Typically Offered: W
Prerequisite: Senior standing.
Current topics in bioengineering, including medical applications and industrial applications. Total credit limited to 16 units, with a maximum of 4 units per quarter. See The Schedule of Classes for topic selected. 4 lectures.

ENGR 459. Multidisciplinary Senior Design Project I. 2 units
Term Typically Offered: F
Prerequisite: Senior standing and consent of instructor.
First of three courses taken sequentially in a team based multidisciplinary senior design project. Identification of sponsor's needs and development of design solution. Test plan development to validate design meets user requirements. Communication of results to project sponsor. Project management, cost analysis, intellectual property analysis, impact analysis on society, and ethical considerations. 2 laboratories.

ENGR 460. Multidisciplinary Senior Design Project II. 2 units
Term Typically Offered: W
Prerequisite: ENGR 459.
Continuation of ENGR 459 and senior project. Activities focus on detail design, analysis and material procurement. 2 laboratories.

ENGR 461. Multidisciplinary Senior Design Project III. 2 units
Term Typically Offered: SP
Prerequisite: ENGR 460.
Continuation of ENGR 460 and completion of senior project. Design verified through prototyping and testing. 2 laboratories.

ENGR 462. Senior Project. 4 units
Term Typically Offered: F,W,SP,SU
Prerequisite: ME 212, junior standing, and consent of instructor.
Selection and completion of project under faculty supervision. Projects typical of problems which graduates must solve in their fields of employment. Project results presented in a formal report. Minimum commitment of 150 hours.
ENGR 470. Selected Advanced Topics. 1-4 units
Term Typically Offered: TBD
Prerequisite: Consent of instructor.

Directed group study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1-4 lectures.

ENGR 471. Selected Advanced Laboratory. 1-4 units
Term Typically Offered: TBD
Prerequisite: Consent of instructor.

Directed group laboratory study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1 to 4 laboratories.

ENGR 481. Senior Project Design Laboratory I. 2 units
Term Typically Offered: TBD
Prerequisite: MATH 244, IME 314, ME 302 or consent of instructor.

Selection, development, and completion of project by individuals or team which is typical of problems graduates must solve in their fields of employment or applied research. Project may involve, but is not limited to, physical modeling and testing of integrated design projects, costs, planning scheduling and research and may involve students from several disciplines. Formulation of outline, literature review, and project schedule. 2 laboratories.

ENGR 482. Senior Project Design Laboratory II. 2 units
Term Typically Offered: TBD
Prerequisite: ENGR 481 or consent of instructor.

Selection, development, and completion of project by individuals or team which is typical of problems graduates must solve in their fields of employment or applied research. Project may involve, but is not limited to, physical modeling and testing of integrated design projects, costs, planning scheduling and research and may involve students from several disciplines. Formulation of outline, literature review, and project schedule. 2 laboratories.

ENGR 483. Senior Project Design Laboratory III. 2 units
Term Typically Offered: TBD
Prerequisite: ENGR 482 or consent of instructor.

Continuation of ENGR 482. Completion of project by individuals or team typical of problems graduates must solve in their fields of employment or applied research. Project may involve, but is not limited to, physical modeling and testing of integrated design projects, costs, planning, scheduling and research, and may involve students from several disciplines. Formulation of outline, literature review, and project schedule. 2 laboratories.

ENGR 493. Cooperative Education Experience. 2 units
CR/NC
Term Typically Offered: TBD
Prerequisite: Sophomore standing and consent of instructor.

Part-time work experience in business, industry, government, and other areas of student career interest. Positions are paid and usually require relocation and registration in course for two consecutive quarters. Formal report and evaluation by work supervisor required. Credit/No Credit grading only. No major credit allowed; total credit limited to 6 units.

ENGR 494. Cooperative Education Experience. 6 units
CR/NC
Term Typically Offered: F,W,SP,SU
Prerequisite: Sophomore standing and consent of instructor.

Full-time work experience in business, industry, government, and other areas of student career interest. Positions are paid and usually require relocation and registration in course for two consecutive quarters. Formal report and evaluation by work supervisor required. Credit/No Credit grading only. No major credit allowed; total credit limited to 18 units.

ENGR 495. Cooperative Education Experience. 12 units
CR/NC
Term Typically Offered: F,W,SP,SU
Prerequisite: Sophomore standing and consent of instructor.

Full-time work experience in business, industry, government, and other areas of student career interest. Positions are paid and usually require relocation and registration in course for two consecutive quarters. A more fully developed formal report and evaluation by work supervisor required. Credit/No Credit grading only. No major credit allowed; total credit limited to 24 units.

ENGR 500. Individual Study. 2-4 units
Term Typically Offered: F,W,SP,SU
Prerequisite: Graduate standing or consent of Program Director.

Advanced study planned and completed under the direction of faculty. Open to graduate students who have demonstrated the ability to do independent work. Total credit limited to 8 units.

ENGR 551. Advanced Topics in Bioengineering. 4 units
Term Typically Offered: TBD
Prerequisite: ENGR 450 or consent of instructor.

Current topic in bioengineering research/application in detail, including medical applications and industrial applications. Takes advantage of capabilities of resident or visiting faculty. Total credit limited to 16 units. See The Schedule of Classes for topic selected. 4 lectures.

ENGR 570. Selected Advanced Topics. 1-4 units
Term Typically Offered: TBD
Prerequisite: Graduate standing or consent of instructor.

Directed group study of selected topics for graduate students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 4 units. 1 seminar, 1 laboratory.

ENGR 571. Selected Advanced Laboratory. 1-4 units
Term Typically Offered: TBD
Prerequisite: Graduate standing or consent of instructor.

Directed group laboratory study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1-4 laboratories.
ENGR 581. Biochemical Engineering. 4 units
Term Typically Offered: TBD
Prerequisite: CHEM 312 and MCRO 221.
Types of microorganisms and microbially-mediated biochemical reactions for biotechnology applications. Stoichiometric and thermodynamic principles for microbial growth and metabolism. Material and energy balances for aerobic and anaerobic growth and bioreactor design. Kinetics of enzyme catalyzed reactions. Field trips required. 3 seminars, 1 laboratory. Crosslisted as ENGR/ENVE 581.

ENGR 591. Thesis Project Design Laboratory. 2 units
Term Typically Offered: TBD
Prerequisite: Graduate standing.
Selection and development of project, by individuals or team, typical of problems graduates must solve in their fields of employment or applied research. Project may involve, but is not limited to, physical modeling and testing of integrated design projects, costs, planning, scheduling and research. Formulation of outline, literature review, and project schedule. 2 laboratories.

ENGR 592. Thesis Project Design Laboratory. 2 units
Term Typically Offered: TBD
Prerequisite: ENGR 591 or consent of instructor.
Continuation of ENGR 591. Completion of project by individuals or team which is typical or problems graduates must solve in their fields of employment or applied research. Project may involve, but is not limited to, physical modeling and testing of integrated design projects, costs, planning, scheduling and research. Formulation of outline, literature review, and project schedule. 2 laboratories.

ENGR 593. Cooperative Education Experience. 2 units
CR/NC
Term Typically Offered: F,W,SP,SU
Prerequisite: Graduate standing and consent of instructor.
Advanced study analysis and part-time work experience in student's career field; current innovations, practices, and problems in administration, supervision, and organization of business, industry, and government. Must have demonstrated ability to do independent work and research in career field. Credit/No Credit grading only.

ENGR 594. Cooperative Education Experience. 6 units
CR/NC
Term Typically Offered: F,W,SP,SU
Prerequisite: Graduate standing and consent of instructor.
Advanced study analysis and full-time work experience in student's career field; current innovations, practices, and problems in administration, supervision, and organization of business, industry, and government. Must have demonstrated ability to do independent work and research in career field. Credit/No Credit grading only.

ENGR 595. Cooperative Education Experience. 12 units
CR/NC
Term Typically Offered: F,W,SP,SU
Prerequisite: Graduate standing and consent of instructor.
Advanced study analysis and full-time work experience in student's career field; current innovations, practices, and problems in administration, supervision, and organization of business, industry, and government. Must have demonstrated ability to do independent work and research in career field. A fully-developed formal report and evaluation by work supervisor required. Credit/No Credit grading only.

ENGR 596. Industry Sponsored Project Experience. 1-9 units
Term Typically Offered: F,W,SP,SU
Prerequisite: Graduate standing.
Designed for MS students who are performing a work-for-others research project that requires a Non-disclosure Agreement. Students who qualify will be required file a detailed, supervised report and undergo an examination on the work performed.

ENGR 599. Design Project (Thesis). 1-9 units
Term Typically Offered: F,W,SP,SU
Prerequisite: Graduate standing.
Each individual or group will select, with faculty guidance and approval, a topic for independent research or investigation resulting in a thesis or project to be used to satisfy the degree requirement. An appropriate experimental or analytical thesis or project may be accepted.