

# Engineering (ENGR)

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## COURSES

### **ENGR 0251. PROBLEM SOLVING IN ENGINEERING PRACTICUM. 2 Hours.**

Supplementary material to ENGR 1251, and student success activities, including Peer-Led Team Learning. Corequisite: ENGR 1251.

### **ENGR 1099. UNDERGRADUATE INDEPENDENT STUDY. 0 Hours.**

Independent study related to Engineering.

### **ENGR 1101. ENTRANCE TO ENGINEERING FOR TRANSFER STUDENTS. 1 Hour.**

Entrance to Engineering for Transfer Students welcomes transfer students to the College of Engineering. Topics include engineering student life, fields of study, ethics, design, and preparing for a successful career.

### **ENGR 1191. UNDERGRADUATE SPECIAL TOPICS IN ENGINEERING. 1 Hour.**

Topics in the field of engineering. Topic may vary from semester to semester. May be repeated for credit when topic changes. Departmental approval required in advance to use for degree credit. Prerequisite: consent of instructor.

### **ENGR 1199. ENGINEERING PROBLEM SOLVING BRIDGE. 1 Hour.**

Expanding on prior knowledge of engineering topics, this course enhances problem solving skills in preparation for subsequent engineering courses. Prerequisite: permission of instructor.

### **ENGR 1204. ENGINEERING FIRST YEAR SEMINAR. 2 Hours.**

Introduction to basic engineering concepts, engineering and its many subfields, ethical responsibilities, creativity and design. Self-management and academic skills necessary for academic and professional success.

### **ENGR 1250. PROBLEM SOLVING IN ENGINEERING. 2 Hours.**

Broad introduction to engineering through the process of applying the principles of mathematics to solve real-life engineering problems. Math topics are presented within the context of engineering applications and reinforced through examples from engineering courses. Also introduces algorithm development through the use of the engineering analysis software MATLAB. Prerequisite: C or better in MATH 1426 (or concurrent enrollment), or C or better in (or concurrent enrollment in) a subsequent mathematics course (MATH 2425, MATH 2326, MATH 3319, HONR-SC 1426, HONR-SC 2425), or a qualifying score on the Math Placement Test (MPT).

### **ENGR 1251. PROBLEM SOLVING IN ENGINEERING FOR PRECALCULUS STUDENTS. 2 Hours.**

Broad introduction to engineering through the process of applying the principles of mathematics to solve real-life engineering problems. Math topics are presented within the context of engineering applications and reinforced through examples from engineering courses. Also introduces algorithm development through the use of the engineering analysis software MATLAB. Available only to students taking Math 1421 (Preparation for Calculus) in the same semester. Additional student success activities will be required. Corequisite: ENGR 0251, and concurrent enrollment in Math 1421.

### **ENGR 1291. UNDERGRADUATE SPECIAL TOPICS IN ENGINEERING. 2 Hours.**

Topics in the field of engineering. Topic may vary from semester to semester. May be repeated for credit when topic changes. Departmental approval required in advance to use for degree credit. Prerequisite: consent of instructor.

### **ENGR 1300. ENGINEERING PROBLEM SOLVING. 3 Hours.**

Broad introduction to the profession of engineering and its different disciplines, through the process of applying the principles of mathematics to solve real-life engineering problems and technical writing assignments. Math topics are presented within the context of engineering applications and reinforced through examples from engineering courses. Also introduces algorithm development through the use of the engineering analysis software MATLAB. Prerequisite: C or better in MATH 1421 (or concurrent enrollment), or C or better in (or concurrent enrollment in) a subsequent mathematics course (Math 1426, Math 2425, Math 2326, Math 3319, HONR-SC 1426, HONR-SC 2425), or a qualifying score on the Math Placement Test (MPT).

### **ENGR 1391. UNDERGRADUATE SPECIAL TOPICS IN ENGINEERING. 3 Hours.**

Topics in the field of engineering. Topic may vary from semester to semester. May be repeated for credit when topic changes. Departmental approval required in advance to use for degree credit. Prerequisite: consent of instructor.

### **ENGR 2100. SUPERVISED ENGINEERING WORK EXPERIENCE. 1 Hour.**

Course is for cooperative education students in engineering to be taken in the semester or summer they are employed. Each student will prepare a technical report based upon their work experience. Students who complete the cooperative program will receive certificates and this will be entered on their transcript. Prerequisite: acceptance into and continuance in the Engineering Cooperative Education Program.

### **ENGR 3000. SUPERVISED ENGINEERING WORK EXPERIENCE. 0 Hours.**

Course is for cooperative education students in engineering to be taken in the semester or summer they are employed. Each student will prepare a technical report based upon their work experience. Students who complete the cooperative program will receive certificates and this will be entered on their transcript. Prerequisite: acceptance into and continuance in the Engineering Cooperative Education Program. May be repeated.

### **ENGR 3100. SUPERVISED ENGINEERING WORK EXPERIENCE. 1 Hour.**

Course is for cooperative education students in engineering to be taken in the semester or summer they are employed. Each student will prepare a technical report based upon their work experience. Students who complete the cooperative program will receive certificates and this will be entered on their transcript. Prerequisite: acceptance into and continuance in the Engineering Cooperative Education Program.

**ENGR 4100. SUPERVISED ENGINEERING WORK EXPERIENCE. 1 Hour.**

Course is for cooperative education students in engineering to be taken in the semester or summer they are employed. Each student will prepare a technical report based upon their work experience. Students who complete the cooperative program will receive certificates and this will be entered on their transcript. Prerequisite: acceptance into and continuance in the Engineering Cooperative Education Program.

**ENGR 4302. ENGINEERING ENTREPRENEURSHIP. 3 Hours.**

Topics include special problems of newly formed firms, planning, start-up business considerations, business strategy, management basics, and business plan design. Students will engage in business and entrepreneurship training and discussion, become aware of basic business operations, and learn about inventions, intellectual property, and the patenting process. Other topics include assessment of possible markets, venture feasibility, teambuilding, and leadership. Opportunities in university environments will be discussed including incubation centers and patent licensing. We address legal issues, Small Business Innovation Research (SBIR) proposal design, SBIR funding from the National Science Foundation (NSF), National Institutes of Health (NIH), and others. Additional topics include the proposal review process, grant reporting, local high-tech business accelerators, angel-group funding, venture plans, and venture capital. Classes will feature lectures from engineering and business faculty as well as presentations by successful entrepreneurs. Course taught as EE 4302, ENGR 4302 and ENGR 5302; credit will be granted only once. Prerequisite: Student must be in an engineering professional program.

**ENGR 4395. SUSTAINABLE ENGINEERING DESIGN PROJECT. 3 Hours.**

Following the engineering design process, students will brainstorm, evaluate, and select among engineering alternatives. Students will evaluate the alternatives based on sustainability criteria, including environmental, economic, and social impacts. Life cycle assessment will be used to quantify environmental and economic impacts of the design alternatives. Students will use decision-making methods and optimization in selecting among alternatives. Prerequisites: ENGR 2300, IE 3315, ECON 2305 or IE 2308.

**ENGR 5302. ENGINEERING ENTREPRENEURSHIP. 3 Hours.**

Topics include special problems of newly formed firms, planning, start-up business considerations, business strategy, management basics, and business plan design. Students will engage in business and entrepreneurship training and discussion, become aware of basic business operations, and learn about inventions, intellectual property, and the patenting process. Other topics include assessment of possible markets, venture feasibility, teambuilding, and leadership. Opportunities in university environments will be discussed including incubation centers and patent licensing. We address legal issues, Small Business Innovation Research (SBIR) proposal design, SBIR funding from the National Science Foundation (NSF), National Institutes of Health (NIH), and others. Additional topics include the proposal review process, grant reporting, local high-tech business accelerators, angel-group funding, venture plans, and venture capital. Classes will feature lectures from engineering and business faculty as well as presentations by successful entrepreneurs.