Common Engineering (EG)

Courses

EG 043 Conference 0 Cr.
A scheduled weekly conference hour with the faculty and senior engineering students for discussions of topics such as placement, professional registration, professional ethics, and professional growth after graduation. The course includes a substantial writing component on ethics. A grade of satisfactory (S) is required for graduation. Classroom 1 hour. Prerequisite: senior standing.

EG 044 Conference 0 Cr.
A scheduled weekly conference hour with the faculty and senior engineering students for preparation of the Fundamentals of Engineering (FE) exam. The student must take the FE exam to receive a satisfactory grade in this course. EG 044 is not required if the student has already passed the FE exam. Classroom 1 hour. Prerequisite: senior standing.

EG 109 Introduction to Engineering I 3 Cr.
An introduction to engineering as a profession, this course presents the concepts and methods of engineering design and their application to solving problems from various engineering disciplines. The use of fundamental engineering skills and the associated tools to aid in defining problems and developing solutions is introduced (e.g. graphical communication/ sketching, algorithmic problem solving, data analysis and visualization). The non-technical aspects of engineering required for career success-teamwork, written and oral communication, and problem-solving are practiced. Classroom 2 hours; laboratory 3 hours.

EG 110 Introduction to Engineering II 3 Cr.
A follow-on to EG 109, this course introduces discipline-specific tools as a context for designing and conducting experiments as well as solving engineering problems related to a specific discipline or a thematic problem area of societal importance. Design projects will include the technical and non-technical aspects of engineering design. This course presumes an understanding of engineering design and problem solving processes. Prerequisite: EG 109 or permission of the David Crawford School of Engineering Director. Classroom 2 hours; laboratory 3 hours.

EG 111 Fundamentals of Engineering I 3 Cr.
An introduction to engineering and the concepts of engineering design. Includes an introduction to graphical communication skills used in engineering through the use of sketching and computer-aided design (CAD) on personal computers. The concepts of orthographic and isometric drawings are stressed and extended to include sections and dimensions. The use of spreadsheets in engineering is also included. This course is open only to students in an Engineering major or those with permission of the Engineering Division Head. Classroom 2 hours, laboratory 3 hours.

EG 112 Fundamentals of Engineering II 4 Cr.
A continuation of the concepts of engineering design. Includes an introduction to engineering computing through the design of algorithms using structured techniques that employ a high-level engineering computer language. This course is open only to students in an Engineering major or those with permission of the Engineering Division Head. Classroom 3 hours, laboratory 2 hours.

EG 201 Engineering Mechanics (Statics, Dynamics) 3 Cr.
A course in elementary engineering mechanics. Vector notation. Force systems, moments, equilibrium, the free body diagram. Friction, simple frames, trusses, beams, centroids, and second moments. Kinematics: rectilinear and curvilinear motion; translation and rotation; relative motion. Kinetics: force, mass, and acceleration; impulse and momentum; work and energ y. Elementary vector calculus. Classroom 3 hours. Corequisites: MA 122 and PS 211.

EG 202 Engineering Mechanics (Statics,Dynamics) 3 Cr.
A course in elementary engineering mechanics. Vector notation. Force systems, moments, equilibrium, the free body diagram. Friction, simple frames, trusses, beams, centroids, and second moments. Kinematics: rectilinear and curvilinear motion; translation and rotation; relative motion. Kinetics: force, mass, and acceleration; impulse and momentum; work and energy. Elementary vector calculus. Classroom 3 hours. Prerequisites: EG 201 and MA 122.

EG 203 Materials Science 3 Cr.
An introduction to the science of materials based on the physics and chemistry of their internal structures. The effects of structure on the properties and behavior of metallic, polymeric, ceramic, semiconductor, and composite materials. Classroom 3 hours. Prerequisite: CH 103.

EG 206 Thermodynamics I 3 Cr.
A study of the fundamental concepts and laws of thermodynamics and of the p operties of pure substances, with applications to engineering processes and operations. Classroom 3 hours. Corequisite: MA 122.

EG 301 Mechanics of Materials 3 Cr.
A course on the concepts of stress and strain; effect of loads; analysis of plane stress and strain; deformations of beams, shafts, and axial members; buckling and combined stresses. Classroom 3 hours. Prerequisite: EG 201.

EG 303 Fluid Mechanics 3 Cr.
A study of fluid properties and their significance. Fundamental mechanics of compressible and incompressible fluid motion with application to engineering problems. Topics include resistance of fluids in laminar and turbulent flow; open-channel flow; fluid statics; dimensional analysis and similitude. Classroom 3 hours. Prerequisite: MA 122; Prerequisite or concurent enrollment: EG 206 or permission of the instructor.

EG 350 Engineering Economics and Decision Analysis 3 Cr.
Engineering Economics and Decision Analysis (3cr.) This course focuses on the application of cost benefit analysis to engineering and other technical projects. Time value of money and accounting perspectives are used to evaluate projects. The concept of risk and its importance to financial decision making is also introduced.

EG 400 Design Thinking and Innovation 3 Cr.
This course explores the experience and practice of innovation by examining creativity as the ability to turn ideas into action. It examines the development, management, evolution, and broad context of emerging technologies and associated ventures. Students will complete innovation challenges from start to finish and leave with an understanding of the key tenets of design thinking and a sense for ways they can incorporate them into their work. This ‘hands-on’, project-based course involves students in the design and development of ‘visual brand languages’ for emerging technologies, foundation exercises in creativity, and case studies based on pivotal products from the past 50 years. Prerequisite: Not open to freshmen students.

EG 447 Special Projects (Technical Elective) 1-6 Cr.
A report on an approved engineering design project or topic area to meet the specific objectives of a student in a particular area of study. Limited to students who have organized plans and/or projects that can be related to their engineering interests. Hours and credits to be arranged. Prerequisite: permission of the curriculum department chair and advisor.

EG 450 Professional Issues 3 Cr.
A course to prepare the engineering student for the non-technical aspects of the engineering profession. Topics covered include engineering registration, ethical responsibilities, malpractice and legal responsibilities, and the business aspects of the engineering profession. Classroom 2 hours. Recitation 2 hours. Prerequisites: junior or senior status.