

ENGINEERING (EGR)

EGR 100 - Introduction to Engineering (1 Credit)

1 lecture, 1 lab, 2 total contact hours

Introduces engineering techniques, methods and history. Explores career options and requirements for various engineering fields. Covers interrelationships within and between engineering, technology and science to allow differentiation between various career choices.

Start Smart

Typically offered: Fall, Spring

EGR 105 - Problem-Solving with Matlab and Excel (1 Credit)

1 lecture, 1 lab, 2 total contact hours

Introduces students to techniques and computer applications for solving problems in engineering and science. Emphasis is on Microsoft Excel and Matlab, software packages required for many junior- and senior-level engineering courses and in professional practice. Topics include problem formulation, data plotting, roots of equations, systems of linear equations, numerical integration, and optimization. Laboratory exercises will allow students to apply these computer tools to solve a variety of practical problems in engineering and science. Prerequisite: MTH 140 with a grade of C or better, or other math placement options into MTH 200 or higher. <https://www.harpercollege.edu/testing/mathplacement.php>

Typically offered: Fall

EGR 110 - Introduction to Electrical and Computer Engineering (4 Credits)

3 lecture, 3 lab, 6 total contact hours

Provides an integrated introduction to selected fundamental concepts and principles in electrical and computer engineering including circuits, electromagnets, communications, electronics, controls and computing. Laboratory experiments focus on practical applications which will be applied to a design product. Prerequisite: Prior or concurrent enrollment in MTH 200 (Calculus I, IAI M1 900-1, IAI MTH 901) or higher with a grade of C or better.

Typically offered: Spring

EGR 120 - Engineering Graphics I (CAD) (4 Credits)

2 lecture, 5 lab, 7 total contact hours

Introduces engineering graphics and design. Includes drafting, dimensioning, tolerancing, fasteners and descriptive geometry. Engineering graphics topics include multi-view orthographic representations, principal auxiliary views, section view and production drawings. Laboratory work is supported by three-dimensional CAD utilizing solid modeling techniques. IAI EGR 941 Prerequisite: MTH 070 (or equivalent) with a grade of C or better, or other placement/Geometry options. Click here for Math placement information: <https://www.harpercollege.edu/testing/mathplacement.php>

Typically offered: Fall, Spring, Summer

EGR 210 - Analytical Mechanics - Statics (3 Credits)

3 lecture, 1 lab, 4 total contact hours

Emphasis analysis of force systems using vectors. Topics include particle statics, general principles and force vectors, rigid body equilibrium, moments of inertia, distributed forces and centroids, analysis of structures, virtual work and friction. IAI EGR 942 Prerequisite: MTH 200 and PHY 201 with grades of C or better.

Typically offered: Fall, Spring, Summer

EGR 211 - Analytical Mechanics - Dynamics (3 Credits)

3 lecture, 1 lab, 4 total contact hours

Emphasis dynamic analysis of rigid bodies. Topics include particle kinematics (rectilinear and curvilinear), Newton's laws, energy, work and momentum methods, planar dynamics and rigid bodies, rigid body kinematics, impulse and momentum, and vibrations. IAI EGR 943 Prerequisite: EGR 210 and PHY 201 with grades of C or better.

Typically offered: Spring

EGR 212 - Mechanics of Solids (3 Credits)

3 lecture, 1 lab, 4 total contact hours

Covers elastic and inelastic relationships involving deformable bodies. Topics include concepts of stress and strain, material properties (elastic and plastic), torsion, shear stresses and deformations, thermal stresses, thin-walled pressure vessels, pure bending, stresses and strains, transverse loading of beams, shear stress and combined loading, transformation of stress and strain (Mohr's Circle), design of beams and shafts for strength, shear and moments diagrams, deflection of beams, energy methods, and columns. IAI EGR 945 Prerequisite: EGR 210 with a grade of C or better.

Typically offered: Spring

EGR 240 - Thermodynamics (3 Credits)

3 lecture, 1 lab, 4 total contact hours

Introduces classical thermodynamics. Topics include basic concepts and definitions, the zeroth law of thermodynamics, the first and second laws of thermodynamics, ideal and real gas behaviors, control-volume energy analysis, entropy, non-reactive ideal gas mixtures and psychrometrics and cycles. Prerequisite: MTH 202 with a grade of C or better.

Typically offered: Spring

EGR 265 - Circuit Analysis (4 Credits)

3 lecture, 3 lab, 6 total contact hours

Introduces analysis of electric circuits, electrical components, and networks. Topics include concepts of electricity and magnetism, circuit variables (units, voltage, inductance, power and energy), circuit elements (R, L, C and operational amplifiers), simple resistive circuits, circuit analysis (node-voltage, mesh-current, equivalents and superposition), transient analysis, and sinusoidal steady state (analysis and power). Introduces standard electrical instruments and measurement techniques. Covers circuit response, elementary filter response and resonance measurements. Includes basic measurements of transistors and operational amplifiers. IAI EGR 931L Prerequisite: MTH 202 (Calculus with Analytic Geometry III) and PHY 202 (General Physics II) with grades of C or better.

Typically offered: Summer

EGR 295 - Independent Study in Engineering (1-4 Credits)

1 lecture, 0 - 6 lab, 1 - 7 total contact hours

Provides a project-based learning experience under the supervision of a faculty member. Designed to permit the student to pursue a course of study not typically available under traditional course structure. The student will contract with the appropriate faculty member for the objectives to be accomplished in the course. May be repeated up to a maximum of four credit hours. Prerequisite: EGR 100 with a grade of C or better and consent of the instructor.

Typically offered: Spring