Engineering Science

ES151 Introduction to Engineering   **Cr-2**

This is an introductory course designed to meet the needa of Engineering Science students. The course provides a look at the various fields of engineering. Topics include, engineering majors and professions, computer literacy for engineers, working in a team setting, use of practical engineering tools, and engineering ethics.

ES171 Engineering Graphics   **Cr-3.5**

The course introduces the basics of engineering drawing, descriptive geometry and graphical mathematics. Topics include freehand and instrumental techniques; orthographic projection of points, lines, planes and solids; auxiliary views and sectional views, working drawings; graphs and graphical calculus; functional and alignment charts; and, vector geometry.

ES175 Engineering Science Design   **Cr-3**

This course covers project proposal writing, project costing, drawing preparation and project specification, group dynamics, and making a product. The course practicum may include assignment to a practicing engineer. Required for Engineering Science students after completing the equivalent of one full-time semester. Prerequisite: ES161 Introduction to Engineering & Science.

ES261 Mechanics of Materials   **Cr-3**

This calculus-based course covers normal and shear stress, materials properties and testing, torsional stress, normal and shear strains, stress concentration, blending stress, point stress, columns, failure theories, combined stresses, beam deflection, and strain gauge application and techniques. Prerequisites: PH261 Engineering Physics 1 and ES271 Engineering Statics.

ES271 Engineering Statics   **Cr-3**

This calculus-based course uses the vector approach to deal with the three-dimensional resolution of forces and moments on rigid bodies in equilibrium, centroids, moments of inertia, and virtual work. Prerequisites: MA152 Calculus 2, and PH261 Engineering Physics 1.

ES272 Engineering Dynamics   **Cr-3**

This calculus-based course uses the vector approach to deal with kinematics and kinetics of particles and rigid bodies. Prerequisites: MA253 Calculus 3 and ES271 Engineering Statics.

ES281 Thermodynamics   **Cr-3**

This course addresses these topics: the zeroth, first and second laws of thermodynamics, thermodynamic equilibrium, thermodynamic properties, cycles, and applications to physical and chemical systems. Prerequisites: MA253 Calculus 3 and PH262 Engineering Physics 2.

ES291 Electrical Circuits 1   **Cr-4**

This course presents a calculus-based introduction to linear circuit analysis. Topics include electrical laws, quantities, and DC and AC circuits. Analysis techniques include mesh and nodal approaches, Thevenin, Norton, superposition, and source transformation, as well as phasor analysis. Balanced three-phase and transformer circuits are presented, analysis techniques are discussed, and computer-based circuit simulation tools are introduced. Corequisites: MA253 Calculus 3 and PH262 Engineering Physics 2.

ES292 Electrical Circuits 2   **Cr-3**

This course covers the complete response of first and second order electrical circuits using the classical solution of differential equations and the Laplace Transform methods. It analyzes circuits containing operational amplifiers. Diodes and their applications in rectifiers and wave shaping circuits are studied. Simple transistor biasing is learned. Prerequisites: ES291 Electrical Circuits 1. Corequisite: MA260 Differential Equations.