EMCH 211 or ET 300 or MCHT 111

ET 322: Strength of Materials

3 Credits

Axial, torsional, bending, and combined stress analysis; deformation and deflection analysis of cables, shafts, and beams; column design and analysis. ET 322 Strength of Materials (3)Strength of materials deals with the relationship among the external forces acting on a body, the resulting stresses (intensity of internal forces) and the deformation (change of size or shape). The determination of proper sizes and material of construction of mechanical components and structural members to satisfy strength and deformation requirements are important topics of strength of materials. The students will be introduced to the concept of stress &ndash; normal, shear and bearing stress, and relate strain to stress using material properties. The students will develop an understanding of design parameters such as design stresses, factors of safety for axial loads, transverse loads and torsional loads, to design components such as beams and circular shafts satisfying strength and deformation requirements. The students will also learn to calculate moments of inertia, centroids and apply parallel axis theorem for moment of inertia. The students will be introduced to the concept of combined stresses and their analysis using graphical and analytical methods. Finally, the concept of buckling in columns will be introduced.

Prerequisite: ET 300, E MCH211 or MCH T111

ET 323: Strength of Materials Laboratory

1 Credits

Measurement of mechanical properties of materials, structural testing. ET 323 Strength of Materials Laboratory (1) The objective of the strength of materials laboratory is to demonstrate the basic principles in the area of strength and mechanics of materials to the undergraduate students through a series of experiments. Students will be conducting experiments using Universal Testing Machines to calculate tensile strength of steel and aluminum samples and experiments to measure hardness of non-heat treated and heat treated steels. Students will also test steel samples in single shear, double shear and impact loading, followed by experiments on the torsion testing machine to calculate torsional strength of aluminum samples and the strut apparatus to analyze different modes of buckling in a slender aluminum column. The laboratory demonstrates important concepts from the strength of materials theory course.

Prerequisite: or concurrent: ET 322, E MCH213 or MCH T213

ET 495: Internship

1-18 Credits/Maximum of 18

Supervised off-campus, nongroup instruction including field experiences, practica, or internships. Written or oral critique of activity required.

Prerequisite: prior approval of proposed assignment by instructor

ET 496: Independent Studies

1-18 Credits/Maximum of 18

Creative projects, including research and design, that are supervised on an individual basis and that fall outside the scope of formal courses.