# **MECHANICS OF MATERIALS-I (ME-212)**

Pre-requisite: None Credit Hours: 03 Contact Hours: 48

### **RECOMMENDED BOOK(S)**

Mechanics of Materials 5th Edition by Ferdinand P. Beer & RusselJohnston Jr. HTMcGraw-Hill. Strength of Materials: Andrew Pytel, Ferdinand L. Singer

## **REFERENCE BOOK(S)**

Mechanics of Engineering Materials by P.P. Benham&R.J.Crawford Longman Sc& Tech (Jul 1987)

D. L. Logan, Mechanics of Materials, Harper Collins, 1991

Gere and Timoshenko, Mechanics of Materials, PWS/ITP Publishing, 1997

# **COURSE OBJECTIVES**

This course is the foundation to many advanced techniques that allow engineers to design machine components, mechanisms, predict failure and understand the physical properties of materials. Mechanics of Materials gives the student basic tools for stress, strain and deformation analysis. Methods for determining the stresses, strains and deformations produced by applied loads are presented. Engineering design concepts are integrated throughout the course. At the completion of the course, students must be able to: 1.) Analyze and design components and structural members subjected to tension, compression, torsion, bending and combined loads using fundamental concepts of stress, strain, elastic and inelastic behavior. 2.) Conduct themselves in a professional manner and with regard to their responsibilities to society; especially with regard to design of mechanisms and prevention of failure. 3.) Communicate their results and conclusions effectively. 4.) Recognize the nature of a comp.

S. No.	CLO/PLOS MAPPING	DOMAIN	PLO
1	<b>Describe</b> and <b>Explain</b> key concepts, such as stresses and strains and constitutive relationships.	C2	01
2	<b>Analyze</b> statically determinate and indeterminate structures for safety based on strength or deflection considerations.	C4	02

### COURSE CONTENTS

Module 1 concept of stress

Module 2 stress and strain – axial loading Module 3 torsion Module 4 pure bending Module 5 analysis and design of beams for bending