

Engineering Mechanics

Code

ME- 100

Credit Hours

3-0

Course Description

This course will focus on the theory and application of engineering mechanics. Students will be introduced to the understanding of basic forces, free body diagrams, vectors, resultants, equilibrium, pulley systems, rigid bodies, truss analysis, frame, machine, internal forces in structural members, friction, center of gravity and centroids, moment of inertia, and composite bodies and areas.

Text Book:

1. *RC Hibbeler, Engineering Mechanics (Statics and Dynamics), 14th Edition, Prentice Hall*
2. *J L Meriam, L G Kraig, Engineering Mechanics (Statics): John Wiley & Sons Inc.*

Reference Book:

1. *Beer & Johnston, Vector Mechanics for Engineers: Statics & Dynamics, McGraw Hill*
2. *Anthony M Bedford, Wallace Fowler. Engineering Mechanics (Statics), Prentice Hall*
3. *E. Nelson, Engineering Mechanics: Statics, Schaum's outline series New York.*

Prerequisites

None

ASSESSMENT SYSTEM FOR THEORY

Quizzes	10%
Assignments	10%
Mid Terms	30%
ESE	50%

Teaching Plan

Week No	Topics	Learning Outcomes
1	Introduction	Course Outline, objectives, teaching plan, assessment method, concepts review

2-3	Force Vectors	Vector Operations, Addition of a system of Coplanar Forces, Addition and Subtraction of Cartesian Vectors, Position Vectors, Force vector directed along a line, Dot Product.
4-5	Equilibrium of a Particle	Conditions for the equilibrium of a Particle, Free Body Diagram, Coplanar Force Systems, Three Dimensional Force Systems
6-7	Force System Resultants	Moment of a Force Scalar and Vector Formulation, Cross Product, principles of Moments, Moment of a Force about a specified Axis and Moment of a Couple, Equivalent System, Resultant of a Force and Couple System
7-8	Equilibrium of a Rigid Body	Conditions of Rigid Body Equilibrium, Equilibrium in Two Dimensional, Free Body Diagrams, Equations of Equilibrium, Two and Three Force members, Constraints for a Rigid Body
9	MID TERM EXAM	
10-11	Friction	Characteristic of dry friction, Problems involving dry friction, Wedges
12-14	Kinematics of Particles	Rectilinear Kinematics, General Curvilinear Motion, Rectangular Components, and Motion of a Projectile, Curvilinear Motion: cylindrical, normal

		and tangential components
15-16	Kinetics of a Particle-Force and Acceleration:	Newton's laws of motion, Equation of motion for a system of particles, Equation of motion in rectangular, cylindrical and tangential coordinates, Central-Force Motion and Space Mechanics
17	Topics from whole course	Class Presentations by Students
18	ESE	