MEC 1102: Engineering Mechanics 1

Hours per semester				Weighted total marks	Weighted exam mark	Weighted continuous assessment mark	Credit unit
LH	PH	TH	CH				
48	24	06	60	100	60	40	4

Brief description of course

This course introduces the students to the basic principles of statics as applied to particles and bodies

Objectives of the course

Students will be able to relate statics principles of mechanics to engineering applications

Learning outcomes

At the end of this course, a student should be able to:

1. To analyze mechanical structures and systems using the basic laws of mechanics
2. Apply the knowledge attained to solve Engineering problems

Course outline

Statics of particles (6 Hours)

Introduction to statics Scalars and vectors Newton's laws Problem solving in statics **Free body diagrams**

Equivalent systems of forces (8 Hours)

Equilibrium of rigid bodies in two dimensions and three dimensions

Analysis of Structures (10 Hours)

Plane trusses,

Analysis of trusses by method of joints and sections, Frames and machines

Forces in Beams and Cables (12 Hours)

Internal forces in beams,

Types of loading and support,

Shear and bending moment diagrams,

Analysis of cables with concentrated and distributed loads

Parabolic cables and catenary cables

Moment of Inertia (8 Hours)

Moment of inertia of areas

Radius of gyration

Parallel axis theorem

moment of inertia of masses

Friction (12 Hours)

Laws of dry friction,

Application of friction in machines(wedges, screws, disks ,wheels, axles and flexible belts)

Method of Virtual Work(10 Hours)

• Work, equilibrium of particles and rigid bodies, potential energy and stability Del**ivery mode**

The course will be taught using lectures, tutorials and assignments.

Assessment methods

The students will be assessed as follows;

Requirement	**Percentage contribution**
Course work	40%
Final examination	60%
Total	100%

Recommended and reference books

1. J. L Meriam and L. G Kraige. 2002, Engineering Mechanics (Statics) Fifth Edition. John Wiley&Sons,Inc.

2. Carleton G. Fanger.1970 Engineering Mechanics. Statics And Dynamics. Charles E.Merrill Publishing Company,Columbus, Ohio.

3. Timoshenko and Young. 2000, Engineering Mechanics Fourth Edition. McGraw-Hill Kogakusha,Ltd.