2CI102: Engineering Mechanics **[3 2 3 1]**

Learning Outcomes:

Upon completion of this course, students will acquire knowledge aboutFundamentals of engineering principles, concept of centre of gravity and moment of inertia, importance of frictional force in real world problems, advantages of using machines, and effect of forces for different phenomenon when the bodies are in motion.

Syllabus:

Unit No.	Topics
1	**INTRODUCTION:** Definition of Statics, Kinetics and Kinematics, Scalar, Vector quantities, Fundamental principle of engineering mechanics, System of units.
2	**FUNDAMENTAL OF STATICS:** Force and Effect of forces, Types of force and force systems, Moment, Couple and its characteristics, Law of parallelogram of forces , Law of polygon of forces , Varignon;s principle Types of Supports and Loads, Support reactions and problems related to theories.
3	**CENTRE OF GRAVITY:** Definition of Centroid centre of gravity, Moment area method for finding out centre of gravity for 1D, 2D and 3D problems, Composite sections, PappusGuldinus theorems I &II.
4	**MOMENTOFINERTIA:** Concept of MI, Methods for finding out MI, Theorem of Parallel Axis and Perpendicular axis and related problems.
5	**EQUILLIBRIUM:** Concept of Free body diagram, Lami's theorem and its applications.
6	**FRICTION:** Terminology, Friction on inclined smooth and rough surfaces, Ladder friction.
7	**SIMPLE LIFTING MACHINES:** Terminology, Conditions of reversibility of machines, Law of machine, method for finding out velocity ratio of simple wheel and axle, Differential wheel and axle, Single purchase crab winch, Double purchase crab winch, Simple screw jack and differential screw jack, related problems.
8	**KINEMATICS:** Terminology, Combined motion of rotation and translations, Case of Crank and Shaft, Instantaneous centre and its location, Single degree free vibrations
9	**KINETICS:** Newton's law of motions, De-Alembert's Principle, Motion of connected bodies on plane and inclined surfaces, Related problems.

Laboratory Work: This shall consist of field and laboratory work based on above content.

Term Work: Term work shall consist of 8 to 10 experiments and assignments consisting theoriesand numerical based on above syllabus