

**Lesson Plan for ENGINEERING MECHANICS (TH.4 b) , 1st year, Common to all branches.
(WINTER-2026)**

Discipline: Civil, Electrical
and Mechanical

Year-
1st year

Name of the Teaching Faculty:
Sri Pitabas Tripathy, Guest Faculty ,Mechanical

SUBJECT:
**ENGINEERING
MECHANICS (TH.4 b)**

No. of Days/
week class
allotted=2

Semester Starts from 17.08.2026

WEEK	PERIOD	TOPICS TO BE COVERED
01	01	Significance and relevance of Mechanics, Applied mechanics, Statics, Dynamics, Space, time, mass, particle, flexible body and rigid body
	02	Scalar and vector quantity, Units of measurement (SI units), Fundamental units and derived units
02	01	Force – unit, representation as a vector and by Bow's notation
	02	Characteristics and effects of a force, Principle of transmissibility of force
03	01	Force system and its classification
	02	Resolution of a force - Orthogonal components of a force
04	01	Moment of a force, Law of moment, State Varignon's Theorem, Couple and it's moment
	02	Composition of forces, Resultant force
05	01	Numerical on force system
	02	Analytical method for determination of resultant for concurrent, non-concurrent and parallel co-planar force system
06	01	Triangle Law of forces and Polygon Law of forces (Statement Only), Parallelogram law of Forces (Statement and Derivation)
	02	Simple Numerical on above
07	01	Simple Numerical on above
	02	Simple Numerical on above
08	01	Equilibrium and Equilibrant, Condition of Equilibrium
	02	Free body and Free body diagram
09	01	Analytical and graphical methods of analyzing equilibrium.
	02	Lami's Theorem – Statement and Explanation
10	01	Application for various engineering problems
	02	Simple Numerical on above
11	01	Beam: Types of Loads, Beam, Supports with their Reactions with neat sketch
	02	Simple Numerical on above
12	01	Simple Numerical on above
	02	Simple Numerical on above
13	01	Friction and its relevance in engineering, types
	02	Laws of friction, limiting equilibrium, limiting friction, co-efficient of friction, angle of friction, angle of repose.
14	01	Relation between co-efficient of friction and angle of friction
	02	Simple Numerical on above
15	01	Equilibrium of bodies on level surface subjected to force parallel and inclined to plane
	02	Equilibrium of bodies on inclined plane subjected to force parallel to the plane only
16	01	Ladder Friction
	02	Simple Numerical on above
17	01	Definition of Centroid.
	02	Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle)

18	01	Centroid of composite figures composed of not more than three geometrical figures
	02	Locate centroid of C
19	01	Locate centroid of L
	02	Locate centroid of T
20	01	Definition of Centre of Gravity (C.G.)
	02	Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere) (Expression Only)
21	01	Simple Numerical on above
	02	Simple Numerical on above
22	01	Definition of Moment of Inertia (M.I.), M.I. of Plane Figures- rectangle, square, triangle, circle, semicircle. (Only Expression)
	02	Parallel Axis Theorem (Statement and Proof)
23	01	Perpendicular Axis Theorem (Statement and Proof)
	02	Determination of Moment of Inertia of Composite Section (I and T-Section).
24	01	Simple Numerical on above
	02	Simple Numerical on above
25	01	Simple lifting machine, load, effort, mechanical advantage, Velocity ratio (V.R.), efficiency of machines, Applications and advantages
	02	Law of machine, Ideal machine, friction in machine, maximum Mechanical advantage and efficiency
26	01	Reversible and non-reversible machines, conditions for reversibility.
	02	Determination of MA, VR and Efficiency of Simple Axle and wheel, Differential Axle and Wheel
27	01	Determination of MA, VR and Efficiency of Worm and worm wheel
	02	Determination of MA, VR and Efficiency of Single purchase and double purchase crab winch
28	01	Determination of MA, VR and Efficiency of Simple Screw Jack
	02	Determination of MA, VR and Efficiency of 1 st , 2 nd and 3 rd System of Pulleys
29	01	Simple Numerical on above
	02	Simple Numerical on above
30	01	Simple Numerical on above
	02	Simple Numerical on above
31	01	Gear, Gear Drive, Types of Gear Drive
	02	Gear Train, Types of Gear Train
32	01	Velocity Ratio of Simple and Compound Gear Train
	02	Numerical on Simple and Compound Gear Train

Pitambar Tripathy
01/08/2026
Concerned faculty


30/7/2026
HOD

Math and Science Department