

**Lesson Plan for ENGINEERING MECHANICS LAB (PR-8) , 1st year, Common to all branches.
(WINTER-2026)**

Discipline: Civil, Electrical and Mechanical		Year- 1 st year	Name of the Teaching Faculty: Sri Pitabas Tripathy, Guest Faculty ,Mechanical
SUBJECT: ENGINEERING MECHANICS LAB (PR-8)		No. of Days/ week class allotted=2	Semester Starts from 17.08.2026
WEEK	PERIOD	TOPICS TO BE COVERED	
01	02	Orientation & Safety Rules in Engineering Mechanics Lab	
02	02	Introductory lecture on lab safety, standard apparatus, measurement techniques, error analysis, and maintaining lab records.	
03	02	Study of Various Equipment Related to Engineering Mechanics	
04	02	Identification and study of force tables, simple machines, friction planes, and moment apparatus. Understanding operational mechanisms	
05	02	M.A., V.R., Efficiency & Law of Machine for Differential Axle and Wheel	
06	02	Experimental set-up, load vs effort measurement, calculating M.A., V.R., and efficiency. Plotting efficiency curve and deriving law of machine.	
07	02	M.A., V.R., Efficiency & Law of Machine Using Simple Screw Jack	
08	02	Experimental determination of effort required to lift varying loads. Calculating velocity ratio from pitch and arm length, finding efficiency and machine law.	
09	02	M.A., V.R., Efficiency & Law of Machine Using Worm and Worm Wheel	
10	02	Demonstration & student performance: measuring turn ratios, calculating V.R., finding effort values, graphing effort vs load and efficiency vs load	
11	02	M.A., V.R., Efficiency & Law of Machine Using Single Purchase Crab	
12	02	Understanding gear train ratio, measuring distance moved by effort and load. Plotting graphs and determining law of machine ($P = mW + C$).	
13	02	M.A., V.R., Efficiency & Law of Machine Using Double Purchase Crab	
14	02	Comparative analysis with single purchase crab. Calculating gear ratios, measuring efficiency across different loads, plotting performance curves.	
15	02	Progressive Assessment - I & Mid-Term Lab Review	
16	02	Evaluation of completed practical reports (Practicals 1-6), viva-voce examination, and skill test on simple machines	
17	02	Resultant of Concurrent Force System Applying Law of Polygon of Forces Using Force Table	
18	02	Setting up concurrent forces on a universal force table, establishing equilibrium with a closing force, verifying Polygon Law of Forces	
19	02	Resultant of Concurrent Force System Graphically	
20	02	Graphical determination of resultant force using vector scale drawings, Bow's notation, space diagrams, and force polygons	

21	02	Resultant of Parallel Force System Graphically
22	02	Graphical construction using funicular polygon and polar diagram to find magnitude, direction, and line of action of parallel force systems.
23	02	Verification of Lami's Theorem
24	02	Experimental setup of three concurrent coplanar forces in equilibrium using pulleys and weights
25	02	Study Forces in Various Members of Jib Crane
26	02	Experimental determination of tension in tie rod and compression in jib under vertical loading. Comparison of experimental forces with graphical/analytical values.
27	02	Coefficient of Friction for Motion on Horizontal and Inclined Plane
28	02	Measuring limiting friction, determining coefficient of friction (μ) for wood on wood / metal surfaces on horizontal plane and angle of repose on inclined plane.
29	02	Determine Centroid of Geometrical Plane Figures
30	02	Experimental determination of centroid for regular and composite plane lamina
31	02	Progressive Assessment - II, Final Record Submission & Comprehensive Viva
32	02	Final practical record verification, comprehensive viva-voce

Pitabas Tripathy
01/08/26
Concerned faculty

HOD
30/7/2026

Math and Science Department