



Govt. Polytechnic Hamirpur
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Name of Faculty	Mohan Lal	Academic Session	August – November 2026
Course Name	Applied Mechanics	Scheme	N-2026
Course Code	ES104	Semester	1st (Civil)
Course Type	Engineering Science (ES)	Semester Start Date	01-08-2026
L-T-P	3-0-0 (L:3, T:0, P:0)	Semester End Date	28-11-2026

STUDY AND EVALUATION SCHEME

Teaching Hours/Week		Internal Assessment		External Assessment				Total		Credit
Theory	Practical	Theory	Practical	Theory	Hrs.	Practical	Hrs.	Theory	Practical	
03 Hrs.	NA	50	NA	100	03 Hrs.	NA	NA	150	NA	03

COURSE OUTCOMES (COs)

On successful completion of this course, students will be able to:-

CO1	Determine resultant of coplanar force systems using analytical methods.
CO2	Analyze moments and equilibrium conditions to determine the resultant and position of force systems.
CO3	Apply the laws of friction to solve friction problems involving limiting equilibrium on horizontal and inclined plane.
CO4	Determine Centroid and Centre of Gravity of composite plane figures & bodies.
CO5	Evaluate the performance of simple lifting machines by applying the laws of machines.

Recommended Books

1	Text Book of Applied Mechanics – Birinder Singh, Katson Publishing House, New Delhi
2	Text Book of Applied Mechanics – A.K. Upadhyay, SK Kataria & Sons, New Delhi
3	A Text Book of Applied Mechanics – S. Ramamurtham, Dhanpat Rai, New Delhi
4	A Text Book of Engineering Mechanics (Applied Mechanics) – R.S. Khurmi, S Chand and Co. Ltd.
5	A Text Book of Applied Mechanics – R.K. Rajput, Laxmi Publications, New Delhi
6	Engineering Mechanics – D.S. Bedi, Khanna Publishing House, New Delhi
7	Mechanics of Materials – Dr. Kirpal Singh, Standard Publishers Distribution, New Delhi

Teaching Plan

Unit No.	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
1. Basics of Mechanics and Force System	1	Introduction: Mechanics, Applied Mechanics, Statics, Dynamics (Kinetics, Kinematics)	10.08.2026		
	2	Utility of mechanics in engineering field; rigid body, flexible body, scalar & vector quantities	13.08.2026		
	3	Laws of forces: definition, measurement of force in SI units, representation	14.08.2026		
	4	Effects of force, characteristics of a force, free body diagram; Force systems and its classification, principle of transmissibility	17.08.2026		
	5	Law of superposition; resultant force	20.08.2026		
	6	Parallelogram law of forces (with derivation)	21.08.2026		
	7	Triangle law of forces; polygon law of forces – analytically	24.08.2026		
	8	Resolution of forces; resolution of a force into two	27.08.2026		

Unit No.	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
		components (orthogonal/non-orthogonal)			
	9	Numerical problems on force systems	28.08.2026		
	10	Numerical problems on force systems (contd.) / Unit-1 revision	31.08.2026		
2. Moment	11	Concept of moment; moment of a force and units of moment	03.09.2026		
	12	Varignon's theorem (definition only)	07.09.2026		
		CLASS TEST-I	10.09.2026		
	13	Equilibrium, equilibrant, general conditions of equilibrium	11.09.2026		
	14	Lami's theorem	14.09.2026		
	15	Numerical problems on Lami's theorem; Resultant and its position in parallel force system (like parallel forces)	17.09.2026		
	16	Resultant and its position in parallel force system (unlike parallel forces) under coplanar forces	18.09.2026		
	17	Numerical problems on moments / Unit-2 revision	21.09.2026		
3. Friction	18	Friction and its relevance in engineering; types and laws of friction	24.09.2026		
	19	Limiting equilibrium, limiting friction, coefficient of friction	25.09.2026		
	20	Angle of friction, angle of repose and their relations	28.09.2026		
	21	Equilibrium of bodies on level surface subjected to force parallel to plane	01.10.2026		
	22	Equilibrium of bodies on level surface subjected to force inclined to plane	05.10.2026		
	23	Equilibrium of bodies on inclined plane subjected to force parallel to the plane	08.10.2026		
	24	Numerical problems on friction	09.10.2026		
	25	Numerical problems on friction (contd.) / Unit-3 revision	12.10.2026		
		CLASS TEST-II	15.10.2026		
4. Centroid and Centre of Gravity	26	Definition of centroid, centre of gravity, axis of symmetry, reference axis	16.10.2026		
	27	Centroid of plane figures: square, rectangle, triangle, circle, semi-circle (without derivation)	19.10.2026		
	28	Determination of centroid of lamina T, L & I shape	22.10.2026		
	29	Centroid of composite plane figures with/without removed portion, using moment method	23.10.2026		
	30	Numerical problems on centroid of composite figures	29.10.2026		
	31	Centre of gravity of symmetrical solid bodies: cube, cuboid, cone (without derivation)	30.10.2026		
	32	Centre of gravity of symmetrical solid bodies: cylinder, sphere, hemisphere (without derivation); Numerical problems on centre of gravity / Unit-4 revision	05.11.2026		
5. Simple Lifting Machine	33	Definition of machine, simple machine, load, effort	06.11.2026		
	34	Velocity ratio, mechanical advantage and efficiency of a machine and their relationship	09.11.2026		
	35	Law of machines; definition of ideal machine, reversible and self-locking machine	12.11.2026		
	36	Simple wheel & axle: mechanical advantage, velocity ratio and efficiency	13.11.2026		
	37	Numerical problems on simple wheel & axle	16.11.2026		

Unit No.	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
	38	Simple screw jack: mechanical advantage, velocity ratio and efficiency	19.11.2026		
	39	Numerical problems on simple screw jack	20.11.2026		
	40	Worm & worm wheel: mechanical advantage, velocity ratio and efficiency	23.11.2026		
	41	Single winch crab: mechanical advantage, velocity ratio and efficiency	26.11.2026		
	42	Numerical problems on lifting machines / Unit-5 revision	27.11.2026		

Home Assignments

Ass. No	Contents of Syllabus Covered	Proposed date	Actual Date	Remarks
1	Unit-I & Unit-II	07.09.2026		
2	Unit-III & Unit-IV	17.10.2026		

Class / House Test

Name of Test	Syllabus Covered in Tests (Unit/Chapter wise)	Proposed date	Actual Date	Remarks
Class Test-I	Unit-I & most of Unit-II	10.09.2026 (2nd week of September)		
Class Test-II	Unit-II & III	15.10.2026 (2nd week of October)		
House Test	Unit-I to Unit-IV	As per HPTSB Academic Calendar		

Signature of Course Teacher with Name
Approved by

OIC/HoD/Principal