

BARGAON INSTITUTE OF TECHNOLOGY

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DISCIPLINE: All Branches	SEMESTER: 1st / 2nd	FROM: _____ TO: _____
SUBJECT: ENGINEERING MECHANICS LAB	COURSE CODE: PR 8	NAME OF FACULTY: _____
TOTAL CLASS AVAILABLE: 64 Periods	NO. OF PERIODS: 02 / WEEK (32 WEEKS)	PROGRESSIVE ASSESSMENT: 25 Marks CREDITS: 1

COURSE OUTCOMES (COS)

- CO-1:** Analyze different simple machines to find out different influencing parameters viz. Mechanical Advantage (M.A.), Velocity Ratio (V.R.), and Efficiency (η).
- CO-2:** Understand the phenomena of friction in different conditions and make analysis through experiment to find out coefficient of friction.
- CO-3:** Determine resultant of various force systems and analyze the equilibrium of a rigid body by Lami's theorem.
- CO-4:** Determine Centroid of geometrical plane figures.

LESSON PLAN / PRACTICAL EXECUTION SCHEDULE

SL.	WEEK	CLASS DATE	PERIODS	TOPICS PLANNED TO BE COVERED / PRACTICALS PERFORMED	SIGNATURE
01	01		2	Introduction & Overview: Introduction to Engineering Mechanics Lab, Lab Safety Rules, and overview of equipment.	
02	02		2	Practical 1: To study various equipment related to Engineering Mechanics.	
03	03		2	Practical 1 (Contd.): Hands-on identification and demonstration of force tables, simple machines, and friction apparatus.	
04	04		2	Practical 2: To find the M.A., V.R., Efficiency, and Law of machine for Differential Axle and Wheel (Part-1).	
05	05		2	Practical 2 (Contd.): Graph plotting (Load vs. Effort, Load vs. Efficiency) for Differential Axle and Wheel.	
06	06		2	Practical 3: To find the M.A., V.R., Efficiency, and Law of machine using Simple Screw Jack (Part-1).	
07	07		2	Practical 3 (Contd.): Observations, calculations, and determination of Law of Machine for Simple Screw Jack.	
08	08		2	Practical 4: Determine M.A., V.R., Efficiency, and Law of machine using Worm and Worm Wheel (Part-1).	
09	09		2	Practical 4 (Contd.): Verification of self-locking property and calculations for Worm and Worm Wheel.	
10	10		2	Practical 5: Determine M.A., V.R., Efficiency, and Law of machine using Single Purchase Crab (Part-1).	
11	11		2	Practical 5 (Contd.): Experimental evaluation of gear teeth ratio, effort, and efficiency curve for Single Purchase Crab.	
12	12		2	Practical 6: Determine M.A., V.R., Efficiency, and Law of machine using Double Purchase Crab (Part-1).	
13	13		2	Practical 6 (Contd.): Comparative study of Single vs. Double Purchase Crab Winch mechanisms.	
14	14		2	Practical 7: Determine resultant of concurrent force system applying Law of Polygon of forces using Force Table (Part-1).	
15	15		2	Practical 7 (Contd.): Graphic & analytical verification of Law of Polygon of forces.	
16	16		2	Practical 8: Determine resultant of concurrent force system graphically.	
17	17		2	Practical 8 (Contd.): Practice problems and drafting vector diagrams for concurrent force systems.	
18	18		2	Practical 9: Determine resultant of parallel force system graphically.	
19	19		2	Practical 9 (Contd.): Constructing funicular polygon and polar diagram to find magnitude and position of resultant force.	
20	20		2	Practical 10: Verify Lami's theorem using Gravesand's apparatus.	
21	21		2	Practical 10 (Contd.): Analytical calculation of forces and percentage error verification for Lami's theorem.	
22	22		2	Practical 11: Study forces in various members of a Jib Crane.	

SL.	WEEK	CLASS DATE	PERIODS	TOPICS PLANNED TO BE COVERED / PRACTICALS PERFORMED	SIGNATURE
23	23		2	Practical 11 (Contd.): Determination of tension in tie rod and compression in jib member experimentally and analytically.	
24	24		2	Practical 12: Determine coefficient of friction for motion on a Horizontal plane.	
25	25		2	Practical 12 (Contd.): Determine coefficient of friction for motion on an Inclined plane.	
26	26		2	Practical 13: Determine centroid of symmetrical geometrical plane figures (Rectangle, Circle, Triangle).	
27	27		2	Practical 13 (Contd.): Determine centroid of unsymmetrical composite plane figures (T-section, L-section, I-section).	
28	28		2	Lab Revision Session 1: Review and repeat experiment sessions for Simple Machines (Practicals 2 to 6).	
29	29		2	Lab Revision Session 2: Review and practice session for Force Systems & Lami's Theorem (Practicals 7 to 11).	
30	30		2	Progressive Assessment: Practical Viva-Voce Evaluation & Record Verification (Batch-A).	
31	31		2	Progressive Assessment: Practical Viva-Voce Evaluation & Record Verification (Batch-B).	
32	32		2	Final Session: Final Record Submission, Lab Skill Check, and Course Wrap-up.	

SUGGESTED LEARNING RESOURCES

1. *Engineering Mechanics* by Prof. Bhankhar Bharat Gokaldas (Download from <https://ekumbh.aicte-india.org/dbook.php>)
2. Bedi D.S., *Engineering Mechanics*, Khanna Publishing House
3. Khurmi, R.S., *Applied Mechanics*, S. Chand & Co. New Delhi
4. Bansal R.K., *A text book of Engineering Mechanics*, Laxmi Publications
5. Ramamrutham, S., *Engineering Mechanics*, S. Chand & Co. New Delhi
6. Dhade, Jamadar & Walawelkar, *Fundamental of Applied Mechanics*, Pune Vidyarthi Gruh
7. Ram, H. D., Chauhan, A. K., *Foundations and Applications of Applied Mechanics*, Cambridge University Press
8. Meriam, J. L., Kraige, L.G., *Engineering Mechanics- Statics, Vol. I*, Wiley Publication, New Delhi

Signature of Faculty

Principal