Program : **Diploma in Architecture/ Automobile Engineering / Civil Engineering & allied programs / Mechanical Engineering & allied programs / Wood & Paper Technology / Environmental Engineering**	
Course Code : **2029**	Course Title: **Engineering Mechanics Lab**
Semester : **2**	Credits: **No Credit**
Course Category: **Engineering Science**	
Periods per week: **3 (L: 0 T: 0 P: 3)**	Periods per semester: **45**

Course Objectives:

- To provide hands-on experience for the students to outline the basic concept of engineering mechanics.
- To experiment with force system and make use of it to solve various engineering problems.

Course Prerequisites:

Topic	Course name	Semester
Knowledge of basic Mathematics	Mathematics I	1
Knowledge of basic Physics	Applied Physics I	1

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Identify the force systems for given conditions by applying the basics of mechanics.	15	Applying
C02	Determine unknown forces of different engineering systems.	6	Applying
C03	Infer centre of gravity and mass moment of inertia.	9	Applying
C04	Determine strains in mutually perpendicular directions under axial tension. Determine the co-efficient of friction on a plane through experimentation	11	Applying
	Lab Exam	4	

CO-PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1				3			
CO2				3			
CO3				3			
CO4				3			

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Identify the force systems for given conditions by applying the basics of mechanics.**		
M1.01	Identify various apparatus related to Engineering Mechanics.	3	Understanding
M1.02	Determination resultant of concurrent force system applying by applying Law of Polygon using force table.	3	Applying
M1.03	Determination of resultant of concurrent force system graphically	3	Applying
M1.04	Determination of resultant of parallel force system graphically.	3	Applying
M1.05	Verify Lami's theorem by finding forces in various members of Jib crane.	3	Applying
CO2	**Determine unknown forces of different engineering systems**.		
M2.01	Determine support reactions for simply supported beam.	3	Applyjng
M2.02	Obtain support reactions of beam using graphical method by drawing link polygon.	3	Applying
	Lab Exam I	2	
CO3	**Infer centre of gravity and moment of inertia**		

M3.01	Determination of centroid of different laminae.	3	Applying
M3.02	Determination of mass moment of inertia of fly wheel and shaft.	3	Applying
M3.03	Verify the law of moments by using a bell crank lever	3	Applying
CO4	**Determine strains in mutually perpendicular directions under axial tension. Determine the coefficient of friction on a plane through experimentation**		
M4.01	Determination of strain under tensile loading.	3	Applying
M4.02	Determination of Coefficient of Friction between two surfaces on horizontal plane.	3	Applying
M4.03	Determination of Coefficient of Friction between two surfaces on inclined plane	3	Applying
	Open ended experiments	2	
	Lab Exam II	2	

Text / Reference:

T/R	Book Title/Author
T1	Khurmi, R.S., Applied Mechanics, S.Chand& Co. New Delhi.
T2	Bansal R K, A Text book of Engineering Mechanics, Laxmi Publications.
T3	Ramamrutham, Engineering Mechanics, S.,S Chand & Co. New Delhi.
T4	Bedi D.S. , Strength of Materials, Khanna Publishing House, Delhi, Ed. 2018
T5	Khurmi, R.S., Strength of Materials, S Chand and Co. Ltd. New Delhi.
T6	Ramamurtham, S, Strength of Materials, DhanpatRai and sons, New Delhi.
	Punmia B C, Strength of Materials, Laxmi Publications (p) Ltd. New Delhi.
R1	Ram, H. D.; Chauhan, A. K. Foundations and Applications of Applied Mechanics, Cambridge University Press.
R2	Meriam, J. L., Kraige, L.G. , Engineering Mechanics- Statics, Vol. I, Wiley Publication, New Delhi.
R3	Rattan S.S., Strength of Materials, McGraw Hill Education; New Delhi.
R4	Bansal R K, Strength of Materials, Laxmi Publications.
R5	Subramaniam R, Strength of Materials, Oxford University Press.

Online Resources:

Sl.No	Website Link
1	https://www.nptel.ac.in/courses/122104015/
2	https://nptel.ac.in/courses/112103109/
3	http://vlab.co.in/