

Branch Name:	Mechanical Engineering
Program Code:	ET101
Course Name:	Kinematics & Dynamics of Machines Practical
Course Code:	2ET1010405P
Pre-requisite Course:	Engineering Mechanics, Elements of Mechanical Engineering

Course Objectives:

1. To describe the common mechanisms and carryout mobility and motion analysis of mechanisms.
2. To develop the analytical skills for velocity and acceleration of any point on a link in different mechanisms.
3. To learn various cam motion profiles and follower mechanism, analyze cam motions.
4. To demonstrate the laws of gearing, types of gears, terminologies of spur gears and analyze the gear trains.
5. To determine unbalance forces and counter them, as these forces may cause adverse effect on the function of the mechanism or machine.
6. To develop a solution oriented approach for any type of vibrations.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	-	-	2	2	-	-	-	-	10	25	10	25	50

Subject Contents:

Sr. No	Detail of Practical	Contact Hours
1.	To study various types of Links, Pairs, Chain and Mechanism.	02
2.	To study inversion of four Bar Mechanism, Single Slider Crank Chain Mechanism and Double Slider Crank Chain Mechanism.	02
3.	To draw velocity diagram of given mechanism by I-center method & relative velocity method.	02
4.	To find out velocity and acceleration of various links/points in slider-crank mechanism by Klein's construction method.	02
5.	To study about different types of gears and gear trains.	02
6.	To study& draw profiles for various types of Cam and Follower arrangement.	02
7.	To study the undamped free vibration of equivalent spring mass system.	02
8.	To Study longitudinal vibrations of spring mass system.	02
9.	To determine the time period and frequency of torsional vibrations of a single rotor & two rotors system.	02

10.	To determine whirling speed of the shaft and study effect of shaft diameter and end conditions on the same.	02
11.	To Understand and verify the fundamental laws of static & dynamic balancing	02

List of Reference Books:

1. Rattan S.S, "Theory of Machines", Tata McGraw-Hill Publishing Company Ltd., New Delhi
2. Sadhu Singh, "Theory of Machines", Pearson Education, Singapore.
3. Ra Ghosh, A, and Malick, A. K, "Theory of Mechanisms and Machines", East West Press Pvt. Ltd.
4. Rao J.S. and Duggipati R.V., "Mechanism and Machine Theory ", Wiley-Eastern Limited, New Delhi
5. Shigley, J.E. and Uicker, J.J. and Pennock, G. R., "Theory of Machines and Mechanisms", Oxford University Press.
6. Bevan Thomas, "Theory of Machines", Pearson Education Publishers.

E-Resources:

1. <https://nptel.ac.in/courses/112105236>
2. <https://ocw.mit.edu/courses/mechanical-engineering/2-003j-dynamics-and-vibration-13-013j-fall-2002/download-course-materials/>

Course Learning Outcomes (CLO):

On completion of this course, the students will be able to

CLO	Description	Bloom's Taxonomy Level
CLO1	Acquire the fundamental principles of Kinematic and mechanisms used in machines	2 Understanding 1 Remembering
CLO2	Understand the principles of Analysis for velocity in different mechanisms	1 Remembering 2 Understanding 6 Creating
CLO3	Understand the principles of Analysis for acceleration in different mechanisms	2 Understanding 1 Remembering 6 Creating
CLO4	Select and evaluate the performance of different cams and followers.	3 Applying 4 Analyze
CLO5	Learn the laws of gearing, types of gears, terminologies of spur gears and solve problems of gear and gear train.	2 Understanding 5 Evaluating 6 Creating
CLO6	Understand the principles of Balancing and analyze the different types of vibrations and vibratory systems	5 Evaluating 4 Analyze

Mapping of CLOs with POs & PSOs:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	H	M	L			M	L				L		H	
CLO2		H	M	M	L	L							L	
CLO3		L	M		H			L	M	M			M	
CLO4		H	H	H	H			L	M	M				H
CLO5		H	H	M	L		L			M				M
CLO6								M		M	L	L		M

H: High, M: Medium, L: Low