

MME206 L: Kinematics and Dynamics Lab

Programme: B.Tech. (MME)
Course: Core

Year: 2nd
Credits: 1

Semester: IV Semester
Hours: 2 / week

Course Context and Overview (100 words):

The objective of the Kinematics and Dynamicslab is to demonstrate the basic working principles of various machines to the undergraduate students through the set of experiments. Experiments are performed to design and analyze the kinematic and dynamic performances of the mechanisms such as four bar link mechanism, slider crank mechanism, cam and follower, spring mass damper system, gyroscope, gear involute etc.

Prerequisites Courses: Nil

(Course name and course code)

Course outcomes (Cos):

On completion of these experiments, the students will have the ability to:
C01 Understand working principles of various types machines
C02 Design and analyze the machines in Msc. Adams software
C03 Develop mathematical model of machines in Matlab/Simulink software
C04 Able to determine the coefficient of friction of belt and pulley
C05 Analyze the performance of gyroscope

List of Experiments:

S. No.	Experiments	Hours
1	To design and analyze the performances of 4 bar link mechanism and single & double slider mechanism in Msc. Adams	2
2	To design and analyze the performances single double slider mechanism in Msc. Adams	2

3	To study the cam follower mechanism in Msc. Adams	2
4	To study the gyroscopic effect on Motorized Gyroscope	2
5	To develop the state space model of spring mass damper system in Matlab/Simulink	2
6	To design and study the quarter car model in Matlab/Simulink	2
7	To perform the experiment for moment of inertia of flywheel	2
8	To generate spur gear involutes tooth profile	2
9	To determine the co-efficient of friction between belt and pulley.	2

Text Books:

- [1] Wilson, CE, Sadler, JP, *Kinematics and Dynamics of Machinery*, Prentice Hall Publication, 3rd Edition, 2001
- [2] Uicker J J Jr., Pennock G R, Shigley J E, *Theory of Machines and Mechanisms*, 8/e Mc Oxford Press, 3rd Edition, 2013
- [3] Norton R L, *Kinematics and Dynamics of Machinery*, McGraw Hill, 1st Edition, 1995

Reference books:

- [1] Ambekar, A G, *Mechanism and Machine Theorys*, Prentice Hall, 2013
- [2] Singh Sadhu, *Theory of Machines*, Pearson Education, 2007

Additional Resources (NPTEL, MIT Video Lectures, Web resources etc.):**Evaluation Methods:**

Item	Weightage
Practical File	30
Final Examination (Experiment and Viva voce)	70

Prepared By:**Last Update: 28-3-2016**