MME206(L): Kinematics and Dynamics Lab

Programme: B.Tech. (MME) Year: 2nd Semester: IV Semester
Course:Core Credits:1 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 todesign 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.

Prerequisite Courses: Nil

Course outcomes (COs):

On completion of these experiments, the students will have the ability to:	
CO1: Understand working principles of various types machines	Experiment 1, 2
CO2: Design and analyze the machines in Msc. Adams software	Experiment 1,2, 3
CO3: Develop mathematical model of machines in Matlab/Simulink software	Experiment 5, 6
CO4: Able to determine the coefficient of friction of belt and pulley	Experiment 9
CO5: Analyze the performance of gyroscope	Experiment 4
CO6: Calculate the moment of inertia of flywheel	Experiment 7
CO7: Able to generate the spur gear tooth profile	Experiment 8

List of Experiments:

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

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

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/eMc 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:
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