Laboratory Name and Location: Dynamics of Machines (Room No 214)

Lab In-charge: Mr. Prashant D. Bhatkar (Assistant Professor)

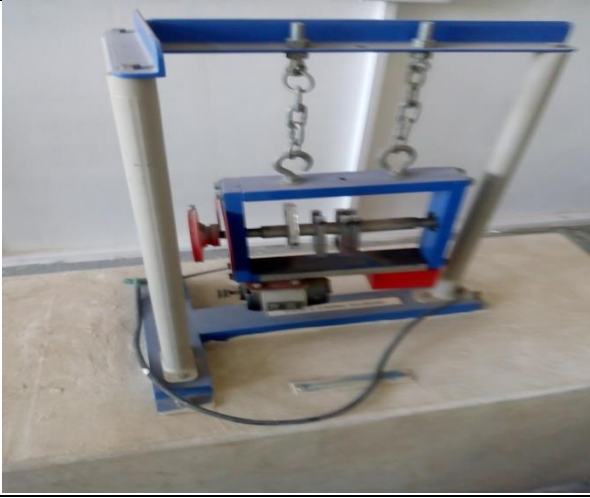**Lab Area: 68.89 sq.m**   **Total Investment (INR): 2.05 Lakh**

List of Major Equipments:

Sr. No.	Name & Specifications of the Equipment	Photograph of the Equipment
1.	**Vibration Setup** Main frame made of ISLC section 100 X 50 mm in section. Gussate plates are provided to frame to keep frame stable.40 X 30 mm length flat provided to connect Gussate plates with main frame .	
2.	**Gyroscope** Circular scale – 0 to 360 ^{0} Dimmer Stat -2 amp Weight set provided -1 to 2 Kg Drive –AC/DC single phase	

3	**Governor** Drive D.C. Motor 0.25 H.P. 1500-rpm Speed. Speed variation arrangement provided. i.e. 2 amp. Dimmerstat	
4	**Balancing of rotating masses setup** Lateral scale- 0 to 20 cm Angular scale -0 to 360 ^{0} Basic frame 50 x20 in section	
5.	**Whirling of shafts setup** Dimmer Stat -2 amp Diameter of Shaft - 5 to 8 mm (900 mm length)	

6.	**Coriollis component of acceleration apparatus** Variable speed=1500 rpm Torque Arm =300 mm Rota meter =300 to 330LPH Spring Balance	

Theory of machines-I

LIST OF EXPERIMENTS

Significance of course : The course imparts the facts, concepts, principles, procedure, kinematics and dynamics involved in different machines elements and mechanisms to develop confidence in becoming successful mechanical engineer.

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1. **Sheet on topic Velocity Analysis, using Relative velocity method**

Aim and Objective-To determine velocity of given mechanism using Relative velocity method

Outcome- Able to calculate velocity of given mechanism using Relative velocity method

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2. **Sheet on topic Velocity Analysis, using Instantaneous centre method**

Aim and Objective-To determine velocity of given mechanism using Instantaneous centre method

Outcome- Able to calculate velocity of given mechanism using Instantaneous centre method

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3. **Sheet on topic Velocity & Acceleration analysis, using Relative acceleration method.**

Aim and Objective-To determine Acceleration of given mechanism using Relative velocity method

Outcome- Able to calculate Acceleration of given mechanism using Relative velocity method

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4. **Sheet on topic Velocity & Acceleration analysis, using Short cut methods**.

Aim and Objective-To determine Velocity & Acceleration of given mechanism using Short cut methods.

Outcome- Able to calculate Velocity & Acceleration of given mechanism using using Short cut methods.

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6. **Experimental determination of velocity and acceleration of Hooke's joint**.

Aim and Objective-To determine velocity and acceleration of Hooke's joint.

Outcome- Able to calculate velocity and acceleration of Hooke's joint.

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7. **Determination of displacement of slider-crank mechanism with the help of model and to plot velocity and acceleration curves from it.**

Aim and Objective-To determine displacement of slider-crank mechanism.

Outcome- Able to calculate displacement of slider-crank mechanism.

8. **Experiment on Corioli's component of acceleration**.

Aim and Objective-To determine Corioli's component of acceleration.

Outcome- Able to calculate Corioli's component of acceleration .

Theory of machines-II

LIST OF EXPERIMENTS

Significance of course : The course imparts the facts, concepts, principles, procedure, kinematics and dynamics involved in different machines elements and mechanisms to develop confidence in becoming successful mechanical engineer.

1. To draw conjugate profile for any general shape of gear tooth .   Aim and Objective-To generate involutes tooth profile   Outcome-Able to generate involutes tooth profile
2. To draw cam profile for various types of follower motions.   Aim and Objective-To draw cam profile for various types of follower motions.   Outcome- Able to draw cam profile for various types of follower motions.
3. **To determine speed vs. lift characteristic curve of a centrifugal governor and to find its coefficient of insensitiveness and stability**.   Aim and Objective-To determine coefficient of insensitiveness and stability.   Outcome- Able to coefficient of insensitiveness and stability.
4. Study of epicyclic gear train and its dynamic behaviour.   Aim and Objective-To Study epicyclic gear train.   Outcome- Able to Study epicyclic gear train.
5. To study various types of lubricating systems.   Aim and Objective- To study various types of lubricating systems.   Outcome- Able to study various types of lubricating systems.

6. Study of various types of gear boxes such as Industrial gear box, Synchromesh gear box, Differential gear box, etc.

Aim and Objective-To Study of various types of gear boxes such as Industrial gear box, Synchromesh gear box, Differential gear box, etc.

Outcome- Able to identify various types of gear boxes.

7. **To determine the natural frequency of damped vibration of a single degree of freedom system and to find its damping coefficient.**

Aim and Objective-To determine natural frequency of damped vibration and its damping coefficient

Outcome- Able to calculate logarithmic decrement (Free Damped Vibrations)

8. Verification of principle of gyroscope and gyroscopic couple using motorized gyroscope.

Aim and Objective-To determine Gyroscopic couple.

Outcome- Able to calculate Gyroscopic couple.

9. To study various types of dynamometers

Aim and Objective-To study various types of dynamometers.

Outcome- Able to identify various types of dynamometers.