LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF MECHACNICAL ENGINEERING

MECHANICS OF MACHINES LAB

INTRODUCTION: The objective of this lab to impart practical knowledge on design and analysis of mechanisms for the specified type of motion in a machine. With the study of rigid bodies motions and forces for the transmission systems, machine kinematics and dynamics can be understood. Demonstration exercises are provided with wide varieties of transmission element models to understand machine kinematics. Experiment with governors, gyroscopes, balancing machines, and universal vibration facilities are available to understand machine dynamics.

COURSE EDUCATIONAL OBJECTIVE: The objective of this course is to demonstrate the concepts of mechanics of machines and mechanical vibrations.

COURSE OUTCOMES:At the end of the course, student will be able to

CO1. Apply the dynamics of cams, gyroscopes to any practical problems.
CO2. Evaluate the speed regulations in governors.
CO3. Analyze the effects of vibrations.
CO4. Analyze the moving parts (rotating and reciprocating) for dynamic and static balance.

Lab Layout:

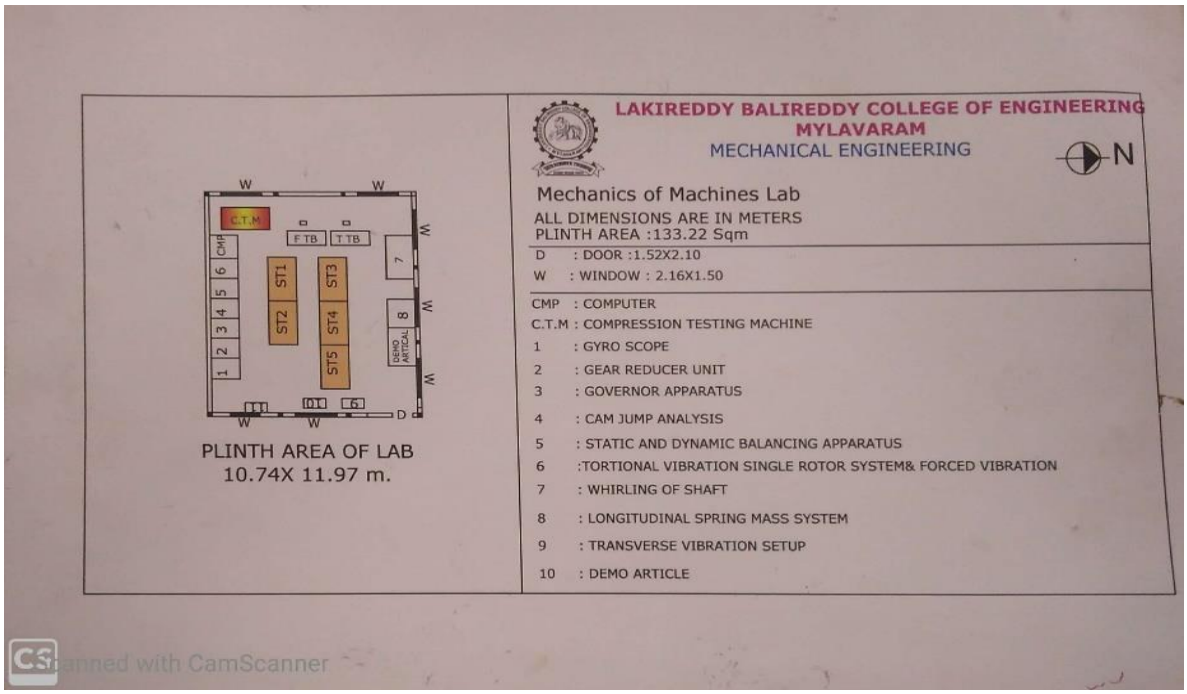

Fig 1: Lab Layout

Equipment Details in Mechanics of Machines Laboratory

S.No	Name of the Equipment	Date of Purchase	Qty	Rate	Amount
1.	Whirling Speed of the Shaft Apparatus	26-11-2012	1	49,157/-	2,99,419/-
2.	Motorized Gyroscope Apparatus	26-11-2012	1	52,900/-	
3.	Cam Jump Apparatus	26-11-2012	1	60,000/-	
4.	Porter/Proel/Hartnell Governor Apparatus	26-11-2012	1	64,000/-	
5.	Balancing of Rotating Masses Apparatus	26-11-2012	1	64,500/-	
6.	Spring Mass System apparatus	01-03-2013	1	18,000/-	2,22,073/-
7.	Transverse Vibration Apparatus	01-03-2013	1	67,500/-	
8.	Balancing of Reciprocating Masses Apparatus	01-03-2013	1	65,000/-	
9.	Gear Reducers Test Rig.	01-03-2013	1	45,000/-	
10.	**Models:** Inversions of Four Bar Mechanism, Single and Double Slider Crank Mechanisms	01-03-2013	2	10,000/-	
11.	**Models:** Gear Trains –Simple, Compound, Reverted, Epicyclical and Differential, Kinematics of Universal Joint.	01-03-2013	6	10,000/-	
				Total Cost	**5,21,492/-**

Mechanics of Machines Lab Photographs:

Fig 2: Lab Entrance

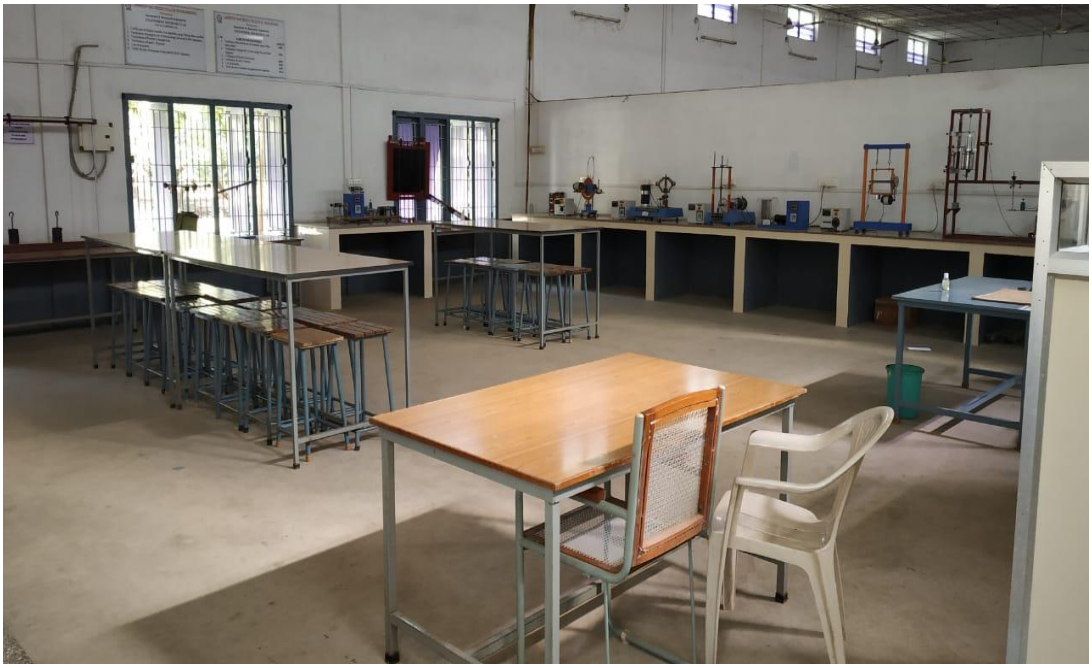

Fig 3: Lab View

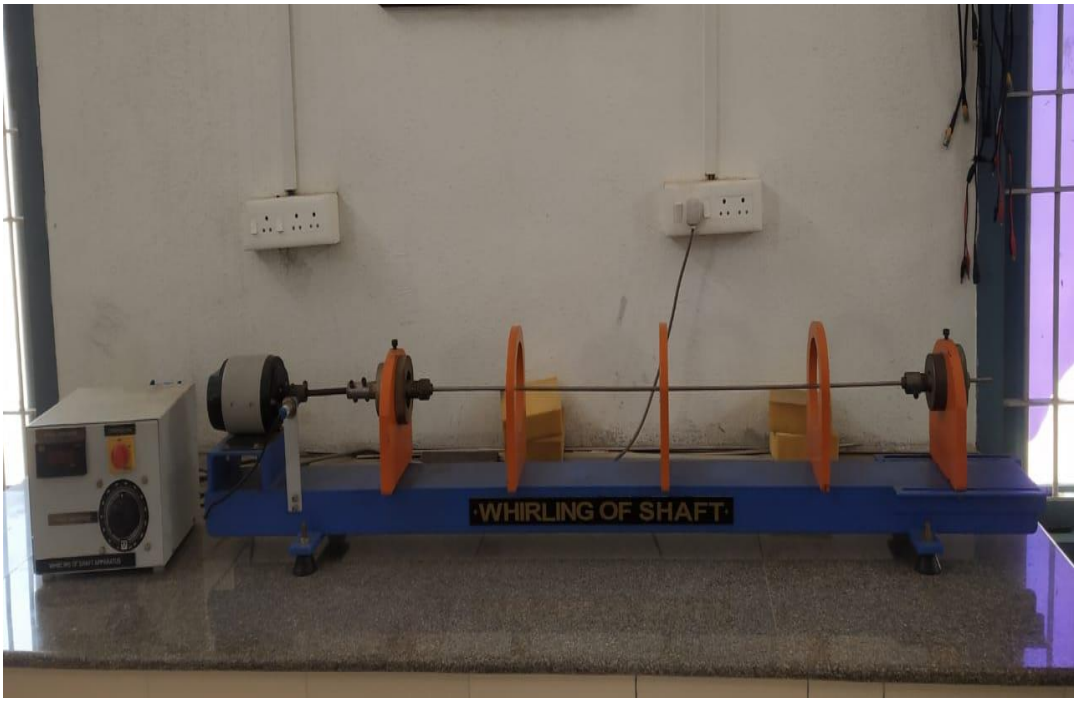

Fig 4: Whirling Speed of Shaft

Specifications: Whirling Speed of Shaft

Specifications	units	Diameter of shafts	Mass of the shaft
Length of shaft	1m	4mm	0.13kg
		5mm	0.20kg
		6mm	0.30kg
Motor Capacity	0.5HP,180V,50HZ,1500RPM		

Fig 5: Longitudinal vibration on spring mass system

Specifications: Longitudinal vibration on spring mass system

Specifications	
Mass of Weight Pan	0.5kg/4.90N
Length of Spring	0.43m
Dead Weights	250 grams,500grams,

Fig 6: Torsional vibration on single rotor system

Specifications: Torsional vibration on single rotor system

Specifications	
Diameter of the shaft	$3x10^{-3}$ m
Length of the shaft	1m
Diameter of disc	$200x10^{-3}$
Mass of the disc	5kg
Modulus of rigidity	$80x10^{9}$ N/m^2

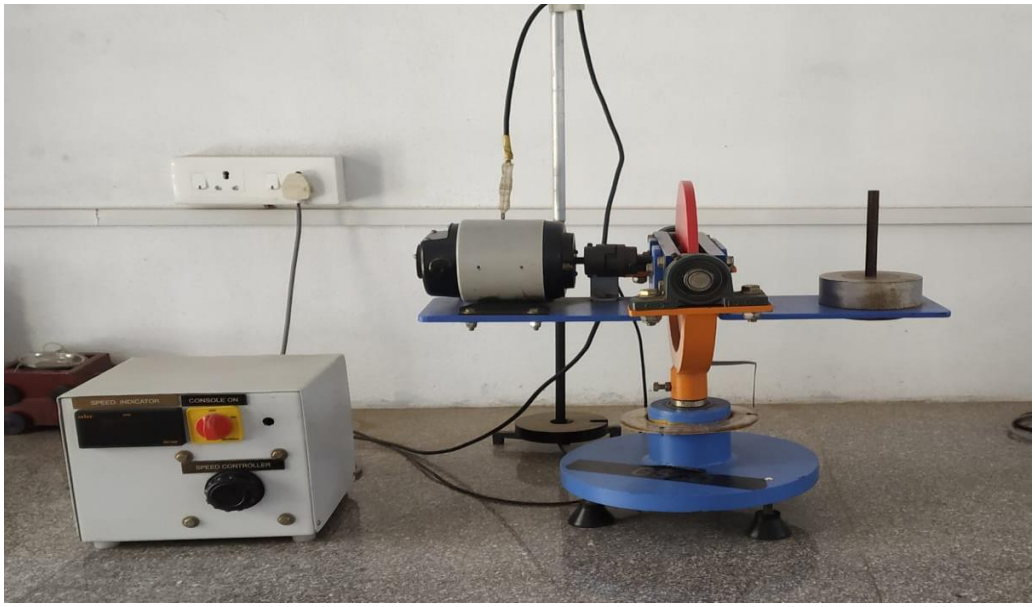

Fig 7: Motorised Gyroscope

Specifications: Motorised Gyroscope

Specifications	
Weight of Disc	2.70 kg
Diameter of disc	210m
Disc Thickness	10mm
Disc between centre of disc and centre of weight stud	196mm
Density of disc	7820 kg/m^3
Dead weights	250grams,500 grams

Laboratory Utilization:

S.No	Laboratory Name	Branch
1	Engineering Mechanics lab	Mechanical, Aerospace II- Semester
2	Dynamics lab	Mechanical V Semester
3	Air craft's Structures lab	Aerospace VI- Semester
4	Mini Projects	Mechanical, Aerospace VI Semester
5	Major projects	Mechanical, Aerospace VIII Semester
6	Project based Lab Experiments	Mechanical, Aerospace III, IV Semester

Lab In charge: Mr. B. Sudheer Kumar M.Tech., (Ph.D)

Technician: Mr. A. D. Mallikarjuna Rao