

**B.Tech. (Third semester) Mechanical engineering**  
**ME 211 E KINEMATICS OF MACHINES (LAB.)**

L	T	P	Class Work	:	50 Marks
-	-	3	Exam	:	50 Marks
			Total	:	100Marks
			Duration of exam	:	3 Hrs.

List of experiments

1. To determine the modulus of rigidity of the material of a closed coil helical spring and the stiffness of a spring
2. To determine the value of coefficient of friction for a given pair of surfaces using friction apparatus
3. To determine the modulus of rigidity of horizontal shaft
4. To determine experimentally the ratio of the cutting time to idle time (cutting stroke to idle stroke) of the crank and slotted lever (QRM)/ Whitworth and compare the result to theoretical values plot the following
  - a.  $\theta$  v/s X (displacement of slider).
  - b.  $\theta$  v/s velocity.
  - c.  $\theta$  v/s Acceleration and to compare the values of velocities  
(Take angles  $\theta = 45^\circ, 90^\circ, 135^\circ, 225^\circ, 270^\circ$  &  $335^\circ$ ,  $\omega = 1$  rad/s)
5. To determine the value of coefficient of friction between the screw and nut of the jack, while:
  - a. Raising the load
  - b. Lowering the load
6. To draw experimentally a curve of the follower-displacement v/s cam-angle. Differentiate the above curve to get velocity and acceleration plot and compare the values with those obtained analytically.
7. To determine the coefficient of friction between belt and pulley and plot a graph between  $\log_{10} T_1/T_2$  v/s,  $\theta$ .
8. To determine the displacement, velocities, & accelerations of the driven shaft of a Hooke's joint for a constant speed of the driver shaft.
9. To determine velocity & acceleration of slider in slider-crank mechanism and plot the following:
  - a.  $\theta$  v/s x (displacement of slider)
  - b.  $\theta$  v/s velocity and
  - c.  $\theta$  v/s acceleration.

Compare the values of velocities & acceleration with those obtained theoretically. (Assume  $\omega = 1$  rad/sec.).

10. Study of the inversions of the single slider crank mechanism.

11. To verify the law of moment using Bell- crank lever.

**Note : Any 8 experiments from the above list and other 2 from others (developed by institute ) are required to be performed by students in the laboratory.**

**B.Tech. (Third semester) Mechanical engineering**  
**ME-213 E THERMODYNAMICS (LAB.)**

L	T	P	Class Work	:	50 Marks
-	-	3	Exam	:	25 Marks
			Total	:	75 Marks
			Duration of exam	:	3 Hrs.

**List of Experiments**

1. Study of 2 stroke petrol and diesel engine models.
2. Study of 4-stroke petrol/diesel engine model.
3. Study of boilers.
4. Study of Babcock-Wilcox boiler (Model).
5. Study of locomotive boiler (Model).
6. Study of Lancashire boiler (Model).
7. To study the Red wood viscometer and measure the viscosity of fluid.
8. To measure the flash point of the given fuel
9. To study the Nestler's boiler.
10. To study various parts of the vertical steam engine.
- 11 To study the diesel engine and make a trial on it.

**Note : Any 8 experiments from the above list and other 2 from others developed by institute ) are required to be performed by students in the laboratory.**

## B.Tech. (Third semester) Mechanical engineering

### ME- 215 E STRENGTH OF MATERIALS LAB

L	T	P		Class Work	:	50	Marks		
-	-	3		Exam	:	25	Marks		
				Total	:	75	Marks		
				Duration of exam	:	3	Hrs.		

#### List of Experiments :

1. To study the Brinell hardness testing machine & perform the Brinell hardness test.
2. To study the Rockwell hardness testing machine & perform the Rockwell hardness test.
3. To study the Vickers hardness testing machine & perform the Vickers hardness test.
4. To study the erichsen sheet metal testing machine & perform the erichsen sheet metal test.
5. To study the Impact testing machine and perform the Impact tests (Izod & Charpy).
6. To study the Universal testing machine and perform the tensile test.
7. To perform compression & bending tests on UTM.
8. To perform the sheer test on UTM.
9. To study the torsion testing machine and perform the torsion test.
10. To draw shear Force, Bending Moment Diagrams for a simply Supported Beam under Point and Distributed Loads.
11. To determine Mechanical Advantage and Efficiency of Single and Double Purchase Winch Crab.
12. To determine Mechanical Advantage and Efficiency of Worm and Worm Wheel.
13. To determine Mechanical Advantage, Efficiency of Simple and Compound Screw Jack.
14. To find Moment of Inertia of a Fly Wheel.

**Note: Any 8 experiments from the above list and other 2 from others (developed by institute) are required to be performed by students in the laboratory.**

## B.Tech. (Fourth semester) Mechanical engineering

### ME- 214 E FLUID MECHANICS LAB

L	T	P				Sessional	:	25	Marks
-	-	3				Practical/Viva	:	25	Marks
						Total	:	50	Marks
						Duration of Exam.	:	3	Hrs.

#### List of Experiments:

1. To determine the coefficient of impact for vanes.
2. To determine coefficient of discharge of an orificemeter.
3. To determine the coefficient of discharge of Notch ( V and Rectangular types).
4. To determine the friction factor for the pipes.
5. To determine the coefficient of discharge of venturimeter.
6. To determine the coefficient of discharge, contraction & velocity of an orifice.
7. To verify the Bernoullis Theorem.
8. To find critical Reynolds number for a pipe flow.
9. To determine the meta-centric height of a floating body.
10. To determine the minor losses due to sudden enlargement, sudden contraction and bends.
11. To show the velocity and pressure variation with radius in a forced vortex flow.

#### Note:

1. At least ten experiments are to be performed in the semester.
2. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus.

## B.Tech. (Fourth semester) Mechanical engineering

### ME- 212 E PRODUCTION TECHNOLOGY LAB

L	T	P		Sessional	: 50 Marks
-	-	4		Practical/Viva	: 50 Marks
				Total	: 100 Marks
				Duration of Exam	: 4 Hrs

List of Experiments:

Introduction to milling machines its types functions applications etc.

1. Practice of slab milling on milling machine.
2. Practice of slotting on milling machine.
3. To cut gear teeth on milling machine using dividing head.
4. Introduction to gear hobber, demonstration of gear hobbing and practice.
5. Introduction to various grinding wheels and demonstration on the surface grinder.
6. Introduction to tool and cutter grinder and dynamometer.
7. Study the constructional detail and working of CNC lathes Trainer.
8. To carry out welding using TIG/MIG welding set.
9. Introduction, demonstration & practice on profile projector & gauges.
10. To make a component on lathe machine using copy turning attachment.
11. To cut external threads on a lathe.
12. To cut multi slots on a shaper machine.
13. To perform drilling and Boring operation on a Component.

**At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus.**

**B.Tech. (Fourth semester) Mechanical engineering****ME 216 E DYNAMICS OF MACHINE (LAB.)**

L	T	P
-	-	3

Sessional	: 25 Marks
Practical/Viva	: 25 Marks
Total	: 50 Marks
Duration of Exam	: 3 Hrs

**LIST OF EXPERIMENT**

1. To determine experimentally, the moment of inertia of a flywheel and axle compare with theoretical values.
2. To find out critical speed experimentally and to compare the whirling speed of a shaft with theoretical values.
3. To find experimentally the Gyroscopic couple on motorized gyroscope and compare with applied couple.
4. To perform the experiment of balancing of rotating parts and finds the unbalanced couple and forces.
5. To determine experimentally the unbalance forces and couples of reciprocating parts.
6. To calculate the torque on a planet carrier and torque on internal gear using epicyclic gear train and holding torque apparatus.
7. To study the different types of centrifugal and inertia governors and demonstrate any one.
8. To study the automatic transmission unit.
9. To study the differential types of brakes.
10. To find out experimentally the corli and component of accelaration and compare with theoretical values.

**At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus.**

**B.Tech. (Fifth semester) Mechanical engineering**  
**ME 313 E Thermal Engineering (Practical)**

L	T	P/D	Total
-	-	2	2

**Theory: 25 Marks**  
**Sessional: 25 marks**  
**Duration of Exam: 03 hours**

**List of Experiments**

1. To make a trial on single cylinder 4-stroke Diesel Engine to calculate B. H. P., S.F.C. and to draw its characteristics curves.
2. To make a trial on 4-stroke high-speed diesel engine and to draw its Heat Balance Sheet.
3. To make a trial on Wiley's jeep Engine at constant speed to calculate B. H. P., S. F. C. Thermal efficiency and to draw its characteristic Curves.
4. To make Morse Test to calculate IHP of the multi cylinder petrol engine and to determine its mechanical efficiency.
5. To calculate the isothermal efficiency and volumetric efficiency of a 2 stage reciprocating air compressor.
6. To find out the efficiency of an air Blower.
7. To make a trial on the Boiler to calculate equivalent evaporation and efficiency of the Boiler.
8. To study the following models;
  - a. Gas Turbine.
  - b. Wankle Engine.
9. To study
  - a. Lubrication and cooling systems employed in various I. C. Engines in the Lab
  - b. Braking system of automobile in the lab
10. To study a Carburetor.
11. To study (1) the Fuel Injection System of a C. I. Engine.
  - a. (11) Battery Ignition system of a S. I. Engine
12. To study Cooling Tower.
13. To study multi Cylinder four strokes vertical Diesel Engine test RIG With Hydraulic Dynamometer.

**Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.**

**B.Tech. (Fifth semester) Mechanical engineering**  
**ME 315 E Fluid Machines (Practical)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>Total</b>
-	-	<b>2</b>	<b>2</b>

**Theory: 25 Marks**  
**Sessional: 25 marks**  
**Duration of Exam: 03 hours**

**List of Experiments**

1. To study and perform test on the Pelton wheel and to plot curves Q, P Vs N at full, three-fourth gate opening.
2. To study and perform test in the Francis Turbine and to plot curves Q, P Vs N at full, three-fourth gate opening.
3. To study and perform test on the Kaplan Turbine and to plot curves Q, P Vs N at full, three-fourth half opening.
4. To study and perform test on Centrifugal Pump and to plot curves  $\eta$ , Power Vs Q
5. To study and perform test on a Hydraulic Ram and to find its Rankine, Aubussion  $\eta$ .
6. To study and perform test on a Reciprocating pump and to plot the P and  $\eta$  Vs H
7. To study and perform test on a Gear Pump and to plot the curves Q.P Vs Pressure rise.
8. Study and perform test on a Torque Convertor and to plot the curves  $\eta$  &  $N_p$ .

**B.Tech. (Fifth semester) Mechanical engineering**  
**ME 317 E                      Heat Transfer (Practical)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>Total</b>
-	-	<b>2</b>	<b>2</b>

**Theory: 25 Marks**  
**Sessional: 25 marks**  
**Duration of Exam: 03 hours**

**List of Experiments**

1. Determination of thermal conductivity of a metal rod
2. Determination of thermal conductivity of an insulating powder
3. Determination of thermal conductivity of a liquid using Guard plate method
4. Determination of thermal resistance of a composite wall
5. Temperature distribution of a pin fin in free-convection
6. Temperature distribution of a pin fin in forced-convection
7. Forced convection heat transfer from a cylindrical surface
8. Determination of Effectiveness of a Heat exchanger
9. Determination of Stefan-Boltzman constant
10. Performance of Solar still
11. Determination of critical heat flux
12. Performance of solar water heater
13. Measurement of solar radiation using solar integrator.

**Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.**

**B.Tech. (Fifth semester) Mechanical engineering**  
**ME 319 E Industrial Engineering (Practical)**

L	T	P/D	Total
-	-	2	2

**Theory: 25 Marks**  
**Sessional: 25 marks**  
**Duration of Exam: 03 hours**

**List of Experiments**

1. To study various Rating Factor systems and find standard time for making small sand mould.
2. To study various plat layouts and suggest improvements in existing Machines Shop layout.
3. To study and draw organizational structure of a near by industry and suggest changes.
4. To draw X and R charts for a given sample of products to check their acceptance.
5. To draw p chart for a given product lot and verify its acceptance
6. Draw a flow process chart with time estimates for a simple welding process.
7. Draw a two handed process chart for a simple process of a job preparation on a lathe.
8. To study various purchase procedures and draw organizational structure of college purchase department.
9. A case study on ABC/VED analysis.
10. A case study on Quality Improvement Techniques (e.g. Hostel Mess/ Workshop / Canteen etc.)
11. A market survey and analysis.
12. A “preliminary project report” preparation for any small-scale unit.

**Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.**

**B.Tech. (Sixth semester) Mechanical engineering  
ME 312 E Refrigeration and Air Conditioning (Practical)**

L	T	P/D	Total
-	-	2	2

**Practical: 25Marks  
Sessional: 25 marks  
Duration of Exam: 03 hours**

**List of Experiments**

1. Study & Performance of basic vapour compression Refrigeration Cycle.
2. To find COP of water cooler.
3. To study the walk in cooler.
4. To study and perform experiment on vapour absorption apparatus.
5. Perform the experiment & calculate various. Performance parameters on a blower apparatus.
6. To find the performance parameter of cooling tower.
7. To study various components in room air conditioner.
8. To find RH of atmosphere air by using sling Psychometric and Psychometric.
9. To find performance of a refrigeration test rig system by using different expansion devices.
10. To study different control devices of a refrigeration system.
11. To study various compressor.
12. To find the performance parameters of Ice Plant.

**Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.**

**B.Tech. (Sixth semester) Mechanical engineering**  
**ME 314 E TRIBOLOGY & MECHANICAL VIBRATION (PRACTICAL)**

L	T	P/D	Total
-	-	2	2

**Practical: 25Marks**  
**Sessional: 50 marks**

**Duration of Exam: 03 hours**

**LIST OF EXPERIMENT:**

1. To study undamped free vibrations of equivalent spring mass system and determine the natural frequency of vibrations
2. To study the free vibration of system for different damper settings. Draw decay curve and determine the log decrement and damping factor. Find also the natural frequency
3. To study the torsional vibration of a single rotor shaft system and to determine the natural frequency.
4. To determine the radius of gyration of given bar using bifilar suspension.
5. To verify the dunker ley's rule
6. To study the forced vibration of system with damping. Load magnification factor vs. Frequency and phase angle vs frequency curves. Also determine the damping factor.
7. To study the pressure distribution of a journal bearing using a journal bearing apparatus.
8. To determine the rate of wear of a metallic pin from the plot of displacement vs time curves by using friction and wear monitor apparatus.
9. To determine abrasion index of a material with the help of dry abrasion test rig.
10. To evaluate the load wear index and the weld point of a lubricant with the help of a four ball stream pressure tester.
11. To determine the two frequencies of torsional spring type double pendulum & compare them with theoretical values.
12. To determine the radius of gyration of a compound pendulum.
13. To determine the radius of gyration of disc using trifilar suspension.

**Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.**

**B.Tech. (Sixth semester) Mechanical engineering**  
**ME 316 E COMPUTER AIDED DESIGN & MANUFACTURING (Practical)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>Total</b>
<b>-</b>	<b>-</b>	<b>2</b>	<b>2</b>

**Practical: 25Marks**

**Sessional: 50 marks**

**Duration of Exam: 03 hours**

**List of Experiments**

Note: Practical will base on course No. ME 308 E.

B.Tech. (Seventh Semester) Mechanical Engineering  
ME 407 E Measurement and Control (Practical)

<b>P/D</b>	<b>Total</b>		<b>Practical</b>	<b>: 25 marks</b>
<b>2</b>	<b>2</b>		<b>Sessional</b>	<b>: 50 marks</b>
			<b>Duration of Exams.</b>	<b>: 03 hours</b>

**List of Experiments**

1. Study of a strain gage based cantilever beam and measurement of strain on the beam
2. Study of a LVDT and measurement of linear displacement
3. Study of an inductive pick up and measurement of linear displacement
4. Study of a LDR and measurement of linear displacement
5. Study of capacitive pick up and measurement of angular displacement
6. Study of temperature transducers and measurement of temperature of fluid
7. Study of a LVDT (strain gage based) and measurement of linear displacement.
8. Study of a torque pick up and measurement of torque .
9. Study of a pressure pick up and measurement of pressure of fluid.
10. Study of load cell and measurement of load with load cell
11. Study of non-contact type speed pick up and measurement of rotational speed
12. Comparison of sensitivity of thermocouple, thermister and RTD

**Note: Total Ten experiments must be performed. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or outside the list.**

