

KARPAGA VINAYAGA COLLEGE OF ENGINEERING AND TECHNOLOGY
Madhuranthagam Taluk - 603 308

Department : Mechanical Engineering

Semester / Year: III / II

Subject Code : ME1204 Name of Lab: Fluid Mechanics and Machinery Lab

List of Major Equipments:

S.No.	Description of Equipment
1	Orifice meter setup
2	Venturi meter setup
3	Rota meter setup
4	Pipe Flow analysis setup
5	Centrifugal pump/submergible pump setup
6	Reciprocating pump setup
7	Gear pump setup
8	Pelton wheel setup
9	Francis turbine setup
10	Kaplan Turbine Setup

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Subject Code : EE1214 Name of Lab: Electrical Engineering Laboratory

List of Major Equipments:

S.No.	Description of Equipment
1	DC Shunt motor.
2	DC Series motor.
3	DC shunt motor-DC Shunt Generator.
4	DC Shunt motor-DC Series Generator.
5	Single phase transformer.
6	Three phase alternator.
7	Three phase synchronous motor.
8	Three phase Squirrel cage Induction motor.
9	Three phase Slip ring Induction motor.
10	Single phase Induction motor.

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Subject Code : ME1205 Name of Lab: Manufacturing Technology Lab - II

List of Major Equipments:

S.No.	Description of Equipment
1	Centre Lathes.
2	Turret and Capstan Lathes.
3	Horizontal Milling Machine.
4	Vertical Milling Machine.
5	Surface Grinding Machine.
6	Tool Dynamometer.
7	Gear Hobbing Machine.
8	CNC Lathe. (Trainer or Industrial Type)

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Department : Mechanical Engineering

Semester / Year: IV / II

Subject Code : CE1263 Name of Lab: Strength of Materials Lab

List of Major Equipments

S.No.	Description of Equipment
1	Universal Tensile Testing machine with double shear attachment - 40 Ton Capacity
2	Torsion Testing Machine (60 NM Capacity)
3	Impact Testing Machine (300 J Capacity)
4	Brinell Hardness Testing Machine
5	Rockwell Hardness Testing Machine
6	Spring Testing Machine for tensile and compressive loads (2500 N)
7	Metallurgical Microscopes
8	Muffle Furnace (800 °C)

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Semester / Year: IV / II

Subject Code : EC1265 Name of Lab: Electronics and Microprocessor Lab

List of Major Equipments

S.No.	Description of Equipment
1	Voltmeters
2	Ammeters
3	PN Diode, BJT, JFET, Logic Gates, Shift Registers and Counters
4	Digital Logic Trainer Kits
5	Breadboards
6	Microprocessor Kits – 8085
7	D/A Converter Interface
8	Stepper Motor Interface
9	CRO
10	Wavefarm Generator
11	Multimeter

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Subject Code : ME1254 Name of Lab: Thermal Engineering Laboratory - I

List of Major Equipments

S.No.	Description of Equipment
1	I.C Engine - 2 stroke and 4 stroke model
2	Red Wood Viscometer
3	Apparatus for Flash and Fire Point
4	4-stroke Diesel Engine with mechanical loading.
5	4-stroke Diesel Engine with hydraulic loading.
6	4-stroke Diesel Engine with electrical loading.
7	Multi-cylinder Petrol Engine
8	Single cylinder Petrol Engine
9	Data Acquisition system with any one of the above engines
10	Steam Boiler with turbine setup

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Department : Mechanical Engineering

Semester / Year: V / III

Subject Code : ME1306 Name of Lab: Dynamics Laboratory

List of Major Equipments

S.No.	Description of Equipment
1	Cam analyzer.
2	Motorised gyroscope.
3	Governor apparatus - Watt, Porter, Proell and Hartnell governors.
4	Whirling of shaft apparatus.
5	Dynamic balancing machine.
6	Static and dynamic balancing machine.
7	Vibrating table
8	Vibration test facilities apparatus

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Semester / Year: V / III

Subject Code : ME1307 Name of Lab: Metrology and Measurement Lab

List of Major Equipments

S.No.	Description of Equipment
1	Micrometer
2	Vernier Caliper
3	Vernier Height Gauge
4	Vernier Depth Gauge
5	Slip Gauge Set
6	Gear Tooth Vernier
7	Sine Bar
8	Bevel Protractor
9	Floating Carriage Micrometer
10	Profile Projector
11	Pneumatic Comparator
12	Temperature Measuring Setup
13	Displacement Measuring Setup
14	Force Measuring Setup
15	Torque Measuring Setup
16	Vibration / Shock Measuring Setup

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Semester / Year: V / III

Subject Code : ME1308 Name of Lab: Computer Aided Machine Drawing Practice

List of Major Equipments

S.No.	Description of Equipment
1	Computer System P - Dual Core Processor @ 3.0 GHz. 17" CRT VGA Colour Monitor. INTEL 945 GC Chipset on HCL OEM Mother Board. 512 MB DDR RAM. 80 GB SATA Hard Disc. Membrane Key Board. Optical Mouse.
2	Laser Printer
3	A2 Size Plotter

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Department : Mechanical Engineering

Semester / Year: VI / III

Subject Code : ME1355 Name of Lab: Thermal Engineering Laboratory - II

List of Major Equipments

S.No.	Description of Equipment
1	Guarded plate apparatus
2	Lagged pipe apparatus
3	Natural convection-vertical cylinder apparatus
4	Forced convection inside tube apparatus
5	Pin-fin apparatus
6	Stefan-Boltzmann apparatus
7	Emissivity measurement apparatus
8	Parallel/counter flow heat exchanger apparatus
9	Single/two stage reciprocating air compressor.
10	Refrigeration test rig
11	Air-conditioning test rig

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Semester / Year: VI / III

Subject Code : ME1356 Name of Lab: CAD/CAM Lab

List of Major Equipments

S.No.	Description of Equipment
	Hardware
1	Computer server.
2	Computer nodes or systems networked to the server. Computer System P - Dual Core Processor @ 3.0 GHz. 17" CRT VGA Colour Monitor. INTEL 945 GC Chipset on HCL OEM Mother Board. 512 MB DDR RAM. 80 GB SATA Hard Disc. Membrane Key Board. Optical Mouse.
3	A3 size plotter.
4	Laser Printer.
5	Trainer CNC lathe.
6	Trainer CNC milling.

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Department : Mechanical Engineering

Semester / Year: III / II

Subject Code : ME1204 Name of Lab: Fluid Mechanics and Machinery Lab

A. List of Experiments

1. Determination of the Coefficient of discharge of given Orifice meter.
2. Determination of the Coefficient of discharge of given Venturi meter.
3. Calculation of the rate of flow using Rota meter.
4. Determination of friction factor for a given set of pipes.
5. Conducting experiments and drawing the characteristic curves of Centrifugal pump / submergible pump.
6. Conducting experiments and drawing the characteristic curves of reciprocating pump.
7. Conducting experiments and drawing the characteristic curves of Gear pump.
8. Conducting experiments and drawing the characteristic curves of Pelton wheel.
9. Conducting experiments and drawing the characteristics curves of Francis turbine.
Conducting experiments and drawing the characteristic curves of Kaplan turbine.

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Department : Mechanical Engineering

Semester / Year: III / II

Subject Code : EE1214 Name of Lab: Electrical Engineering Laboratory

A. List of Experiments

1. Load test on DC Shunt & DC Series motor.
2. O.C.C & Load characteristics of DC Shunt and DC Series generator.
3. Speed control of DC shunt motor. (Armature, Field control)
4. Load test on single phase transformer.
5. O.C & S.C Test on a single phase transformer.
6. Regulation of an alternator by EMF & MMF methods.
7. V curves and inverted V curves of synchronous Motor.
8. Load test on three phase squirrel cage Induction motor.
9. Speed control of three phase slip ring Induction Motor.
10. Load test on single phase Induction Motor.
11. Study of DC & AC Starters.

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Subject Code : ME1205 Name of Lab: Manufacturing Technology Lab - II

A. List of Experiments

1. Two or More Metal Cutting Experiments
(Example: Shear Angle Measurement, Cutting Force Measurement, Cutting Temperature Measurement, Tool Wear Measurement, Life Measurement etc.)
2. One or More Exercises in Milling Machines
(Example: Milling Polygon Surfaces, Gear milling, Keyway milling, Helical Groove milling etc.)
3. Two or More Exercises in Grinding / Abrasive machining
(Example: Surface Grinding, Cylindrical Grinding, Centreless Grinding, Lapping, Honing etc.)
4. Two or More Exercises in Machining Components for Assembly of different fits.
(Example: Machining using Lathes, Shapers, Drilling, Milling, Grinding Machines etc.)
5. One or More Exercises in Capstan or Turret Lathes
6. One or More Exercises in Gear Machining
(Example: Gear Cutting, Gear Shaping, Gear Hobbing etc.)
7. One or More Exercises in CNC Machines
(Example: CNC Programming, CNC Tooling, CNC Machining etc.)

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Semester / Year: IV / II

Subject Code : CE1263 Name of Lab: Strength of Materials Lab

A. List of Experiments

1. Tension test on a mild steel rod
2. Double shear test on Mild steel and Aluminium rods
3. Torsion test on mild steel rod
4. Impact test on metal specimen
5. Hardness test on metals - Brinnell and Rockwell Hardness Number
6. Deflection test on beams
7. Compression test on helical springs
8. Strain Measurement using Rosette strain gauge
9. Effect of hardening- Improvement in hardness and impact resistance of steels.
10. Tempering- Improvement Mechanical properties Comparison
 - (i) Unhardened specimen
 - (ii) Quenched Specimen and
 - (iii) Quenched and tempered specimen.
11. Microscopic Examination of
 - (i) Hardened samples and
 - (ii) Hardened and tempered samples.

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Subject Code : EC1265 Name of Lab: Electronics and Microprocessor Lab

A. List of Experiments

Electronics

1. VI Characteristics of PN Junction Diode
2. VI Characteristics of Zener Diode
3. Characteristics of CE Transistor
4. Characteristics of JFET
5. Characteristics of Uni Junction Transistor
6. RC or Wein Bridge Oscillator
7. Study of Logic Gates (Basic Gates)
8. Half Adder and Full Adder
9. Shift Registers and Counters
10. Operational Amplifier (Adder, Subtractor, Differentiator, Integrator, Inverting and Non - Inverting)

Microprocessor

1. Block Transfer
2. 8 bit Addition, Subtraction
3. Multiplication and Division
4. Maximum and Minimum of block of data
5. Sorting

6. Stepper Motor Interfacing

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Subject Code : ME1254 Name of Lab: Thermal Engineering Laboratory - I

A. List of Experiments

I.C Engine Lab and Fuels Lab

1. Valve Timing and Port Timing Diagrams.
2. Performance Test on 4-stroke Diesel Engine.
3. Heat Balance Test on 4-stroke Diesel Engine.
4. Morse Test on Multi cylinder Petrol Engine.
5. Retardation Test to find Frictional Power of a Diesel Engine.
6. Determination of Viscosity - Red Wood Viscometer.
7. Determination of Flash Point and Fire Point.

Steam Lab

1. Study of Steam Generators and Turbines.
2. Performance and Energy Balance Test on a Steam Generator.
3. Performance and Energy Balance Test on Steam Turbine.

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Department : Mechanical Engineering

Semester / Year: V / III

Subject Code : ME1306 Name of Lab: Dynamics Laboratory

A. List of Experiments

1. Governors - Determination of sensitivity, effort, etc. for Watt, Porter, Proell, Hartnell governors.
2. Cam - Study of jump phenomenon and drawing profile of the cam.
3. Motorised Gyroscope-Verification of laws -Determination of gyroscopic couple.
4. Whirling of shaft-Determination of critical speed of shaft with concentrated loads.
5. Balancing of reciprocating masses.
6. Balancing of rotating masses.
7. Determination of moment of inertia by oscillation method for connecting rod and flywheel.
8. Vibrating system - spring mass system-Determination of damping co-efficient of single degree of freedom system.
9. Determination of influence co-efficient for multidegree freedom suspension system.
10. Determination of transmissibility ratio - vibrating table.
11. Determination of torsional frequencies for compound pendulum and flywheel system with lumped Moment of inertia.
12. Transverse vibration –free- Beam. Determination of natural frequency and deflection of beam.

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Department : Mechanical Engineering

Semester / Year: V / III

Subject Code : ME1307 Name of Lab: Metrology and Measurement Lab

A. List of Experiments

1. Calibration of Vernier / Micrometer / Dial Gauge.
2. Checking Dimensions of part using slip gauges.
3. Measurements of Gear Tooth Dimensions.
4. Measurement of Taper Angle using sine bar / tool makers microscope.
5. Measurement of straightness and flatness.
6. Measurement of thread parameters.
7. Checking the limits of dimensional tolerances using comparators. (Mechanical/
Pneumatic /Electrical)
8. Measurement of Temperature using Thermocouple / Pyrometer.
9. Measurement of Displacement. (Strain Gauge / LVDT / Wheatstone Bridge)
10. Measurement of Force.
11. Measurement of Torque.
12. Measurement of Vibration / Shock.

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Subject Code : ME1308 Name of Lab: Computer Aided Machine Drawing Practice

A. List of Experiments

Assembly Drawing

1. Flange coupling.
2. Plummer block bearing.
3. Lathe Tailstock.
4. Universal Joint.
5. Machine vice.
6. Stuffing box.
7. Piston and connecting rod.

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Subject Code : ME1355 Name of Lab: Thermal Engineering Laboratory - II

A. List of Experiments

Heat Transfer

1. Thermal conductivity measurement by guarded plate method.
2. Thermal conductivity of pipe insulation using lagged pipe apparatus.
3. Natural convection heat transfer from a vertical cylinder.
4. Forced convection inside tube.
5. Heat transfer from pin-fin. (natural & forced convection modes)
6. Determination of Stefan-Boltzmann constant.
7. Determination of emissivity of a grey surface.
8. Effectiveness of Parallel/counter flow heat exchanger.

Refrigeration and Air Conditioning

1. Determination of COP of a refrigeration system.
2. Experiments on air-conditioning system.
3. Performance test on single/two stage reciprocating air compressor.

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Subject Code : ME1356 Name of Lab: CAD/CAM Lab

A. List of Experiments

Computer Aided Design (CAD)

1. 3D Part modeling - protrusion, cut, sweep, draft, loft, blend, rib.
2. Editing - Move, Pattern, Mirror, Round, Chamfer.
3. Assembly - creating assembly from parts - assembly constraints.
4. Conversion of 3D solid model to 2D drawing - different views, sections, isometric view and dimensioning.
5. Introduction to Surface Modeling.
6. Introduction to File Import, Export - DXF, IGES, STL, STEP.
7. 3D modeling of machine elements like flanged coupling, screw jack etc.

Computer Aided Manufacturing (CAM)

1. Manual Part Programming (Using G and M Codes) in CNC lathe.

- 1.1. Part programming for Linear and Circular interpolation, Chamfering and Grooving.
- 1.2. Part programming using standard canned cycles for Turning, Facing, Taper turning and Thread cutting.

2. Manual Part Programming (using G and M codes) in CNC milling.

- 2.1. Part programming for Linear and Circular interpolation and Contour motions.

2.2. Part programming involving canned cycles for Drilling, Peck drilling, and Boring.

Simulation and NC Code Generation

1. NC code generation using CAD / CAM softwares - Post processing for standard CNC Controls like FANUC, Hiedenhain etc.