

Faculty of Mechanical Engineering
B.E. Mechanical and Automation Engineering
(R 2021) Semester – II

Course Code: BE3273		
Course Title: Basic Electrical, Electronics Engineering and Measurements Laboratory		
Sl. No.	Description of Equipment	Required numbers (for batch of 30 students)
1	Verification of ohms and Kirchhoff's Laws 1. DC Regulated Power supply (0 - 30 V variable) 2. Bread Board 3. Resistors 4. Multimeter 5. Connecting wires	1 1 As per Circuit diagram 1 As Required
2	Load test on DC Shunt Motor. 1. Ammeter MC (0-20A) 2. Voltmeter MC (0-300)V 3. Rheostat 7.5 Ω, 10 A 4. Tachometer 5. Field Rheostat 175 Ω, 1.5 A 6. Connecting wires	1 1 1 1 1 As Required
3	Load test on Self Excited DC Generator 1. DC shunt generator(0- 300V) 2. Ammeter (0-30 A), (0-2A) 3. Voltmeter (0-30V) 4. Rheostat 175Ω, 250 Ω 5. Tachometer 6. Connecting Wires	1 1 1 1 1 As Required
4	Load test on Single phase Transformer 1. Ammeter (0-30) A, (0-5) A 2. Voltmeter (0-150)V, (0-300)V 3. Wattmeter – 300V, 5A, UPF 4. Autotransformer 5. Single phase Transformer 6. Connecting wires	1 1 1 1 1 As Required
5	Load Test on Induction Motor 1. Ammeter MI (0-20A) 2. Voltmeter MI (0-300)V 3. Wattmeter – 300V, 30 A 4. Tachometer – Digital 5. Connecting Wires – As Required 6. Single phase Induction motor	1 1 1 1 As Required 1
6	A. Experiment on Transistor based application circuits (Inverting and non-inverting amplifier or switching circuits) 1. Transistor (No-BC107) 2. Resistors- 2.2kΩ, 47KΩ, 10KΩ, 560Ω 3. Capacitors - 10μF, 3.3μF, 22μF 4.. Bread Board 5. DC Regulated Power supply (0 - 30 V variable)	1 1 1 1 1

	5. CRO 6. Connecting wires B. Experiments on Operational Amplifier based Inverting and non-inverting amplifier 1. Function Generator 1 KHz 2. CRO 20 MHz 3. Dual RPS 0 – 30 V 4. Op-Amp IC 741 5. Resistors R1= 100 Ω and RF= 1.5 K Ω 6. Connecting wires	1 As Required 1 1 1 1 As Required
7.	Experiments on ADC 1. Resistors – 10 K Ω 2. Resistors - 220 Ω 2. Capacitor – 150 μ F, 10 μ F 3. ADC -0804 4. Bread Board 5. Connecting wires 6. Dual RPS (0 – 30) V	2 8 1 1 1 As Required 1
8,	Experiments on 555 timer 1. IC 555 Timer 2. Resistor R1, R2 47k Ω , 1k Ω 3. Resistor R4 220 Ω Load 4. Capacitor, C1 10 μ F 5. Capacitor, C2 0.01 μ F 6. Bread Board 7. Connecting wires 8. CRO 20 MHz 9. RPS (0 – 30) V	1 1 1 1 1 1 As Required 1 1
9,10.	Study on function of DSO. Measurement of Amplitude, Frequency, Time, Phase Measurement using DSO 1. DSO	1

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ME3382

MANUFACTURING TECHNOLOGY LABORATORY

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

Sl. No.	Description of Equipment	Required numbers
1.	Centre Lathes	7 Nos.
2.	Shaper	1 No.
3.	Horizontal Milling Machine	1 No.
4.	Vertical Milling Machine	1 No.
5.	Surface Grinding Machine	1 No.
6.	Cylindrical Grinding Machine	1 No.
7.	Radial Drilling Machine	1 No.
8.	Lathe Tool Dynamometer	1 No.
9.	Milling Tool Dynamometer	1 No.
10.	Gear Hobbing Machine	1 No.
11.	Gear Shaping Machine	1 No.
12.	Arc welding transformer with cables and holders	2 Nos.
13.	Oxygen and Acetylene gas cylinders, blow pipe and other welding outfit	1 No.
14.	Moulding table, Moulding equipments	2 Nos.

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MR3361 ELECTRICAL DRIVES AND ACTUATORS LABORATORY

Sl.No.	Description of Equipment	Required Numbers
1.	DC Motor with load	1
2.	3 Phase Induction Motor with load	1
3.	3 Phase Synchronous Motor with load	1
4.	Rheostat based Speed control of motors (AC and DC) with load	1
5.	MOSFET, IGBT, SCR and TRAIC	1
6.	DC motor with speed control Drive	1
7.	DC servomotor with Power Electronic Drive (Position, Direction and speed).	1
8.	BLDC and PMDC motors with Power Electronic Drive (Position, Direction and speed).	1
9.	Stepper Motor with Power Electronic Drive (Position, Direction and speed).	1
10.	Three-phase Induction Motor with Power Electronic Drive.	1
11.	VFD with single phase and three-phase induction motor.	1
12.	AC servomotor with Power Electronic Drive (Position, Direction and speed).	1
13.	Tachometers, voltmeters, ammeters and multimeters	Each 5

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MR3461 SENSORS AND INSTRUMENTATION LABORATORY

Sl.No.	Description of Equipment	Required Numbers
1.	Load, Torque and Force using Strain Gauge Measurement setup	Each -1
2.	Pressure Sensor and Piezoelectric Force Sensor Measurement setup	Each 1
3.	LVDT setup	1
4.	Temperature Sensors measurement setup with RTD, Thermocouple and Thermistor	Each 1
5.	Measurement setup Optical Sensors LDR, Photo transistor, photo diode	Each 1
6.	Measurement setup -Ultrasonic and Laser Sensor	Each 1
7.	Gyroscope measurement setup	1
8.	Accelerometer measurement setup	1
9.	Magnetometer measurement setup	1
10.	Absolute Encoders and Incremental encoder with DSO/ single board computer	Each 1
11.	DAQ with sensor or transducer	1
12.	3 axis force sensor with measurement setup	1
13.	Tactile Sensor with touch measurement setup	1

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CE3481 STRENGTH OF MATERIALS AND FLUID MACHINERY LABORATORY

LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

Sl.No.	Description of Equipment	Required Numbers
1	Venturimeter setup	1 No.
2	Friction Apparatus setup	1 No.
3	Metacentric Height apparatus setup	1 No.
4	Impact of jet setup	1 No.
5	Centrifugal pump set up	1 No.
6	Reciprocation pump set up	1 No.
7	Pelton Wheel turbine set up	1 No.
8	Stop watch	15 No.
9	IM wooden seal	15 Nos.
10	Tachometer	1 No.

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MR3561 INDUSTRIAL AUTOMATION LABORATORY

Sl.No.	Description of Equipment	Required Numbers
Hydraulic Equipment		
1.	Pressure relief valve	4
2.	Pressure reducing valves	2
3.	Flow control valves	2
4.	Pressure switch	1
5.	Limit switches	2
6.	Linear actuator	1
7.	Rotary actuator	1
8.	Double solenoid actuated DCV	1
9.	Single solenoid actuated DCV	1
10.	Hydraulic power pack with pump and pressure relief valve	1
11.	PLC with hydraulic interface	1 set
Pneumatics Equipment		
1.	Pneumatic trainer kit with FRL Unit, Single acting cylinder, push button	1
2.	Pneumatic training kit with FRL unit, Double acting cylinder, manually actuated DCV	1
3.	Pneumatic trainer kit with FRL unit, Double acting cylinder, Pilot actuated DCV	1
4.	Pneumatic trainer kit with FRL unit Double acting cylinder, Double solenoid actuated DCV, DCV with sensor / magnetic reed switches	1
5.	PLC with Pneumatic Interface.	1
Industrial Automation Equipment		
1.	PLC to PLC communication station IOs with sensors and actuators.	1 set
2.	<ul style="list-style-type: none"> • Bottle Filling System. • Material Filling • Object Sorting • Orientation Check • Material Property Check. • Material Handling, Delaying Conveyor, Feeding, Pick and Place Operation 	Each 1 No.

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ME3581

METROLOGY AND DYNAMICS LABORATORY

LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

METROLOGY

SI. No.	Name of the Equipment	Required Numbers
1	Micrometer	5 Nos.
2	Vernier Caliper	5 Nos.
3	Vernier Height Gauge	2 Nos.
4	Vernier Depth Gauge	2 Nos.
5	Slip Gauge Set	1 No.
6	Gear Tooth Vernier	1 No.
7	Sine Bar	1 No.
8	Floating Carriage Micrometer	1 No.
9	Profile Projector / Tool Makers Microscope	1 No.
10	Mechanical / Electrical / Pneumatic Comparator	1 No.
11	Autocollimator	1 No.
12	Coordinator Measuring Machine	1 No.
13	Surface finish Measuring Equipment	1 No.
14	Bore Gauge	1 No.
15	Telescope Gauge	1 No.

LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

DYNAMICS

SI. No.	Name of the Equipment	Required Numbers
1	Cam follower setup	1 set
2	Motorised gyroscope	1 No.

3	Govenor apparatus – Watt, Porter, Proell and Hartnell governors	1 No.
4	Whirling of shaft apparatus	1 No.
5	Dynamic balancing machine	1 No.
6	Two rotor vibration setup	1 No.
7	Spring mass vibration system	1 No.
8	Torsional Vibration of single rotor system setup	1 No.
9	Gear Models	1 No.
10	Kinematic Models to study various mechanisms	1 No.
11	Turn table apparatus	1 No.
12	Transverse vibration setup of a) cantilever	1 No

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AN3711 MECHATRONICS AND ROBOTICS LABORATORY

Sl.No.	Description of Equipment	Required Numbers
1	Computers	30 Numbers
2	CAD Modelling Software	15 Users (Licensed or Open source).
3	Simulation Software with toolbox (Licensed or Open source)	15 Users (Licensed or Open source).
4	Robotic Operating System (ROS) with supported libraries	30 User (Licensed or Open source).
5	Robo Analyser open source software	2 Users
6	Robot with gripper and accessories	1 No
7	Camera with lenses, stand and software	1 No