

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

Course Code: BE3271 Course Title: Basic Electrical and Electronics Engineering Laboratory

Sl. No.	Description of Equipment	Required numbers (for batch of 30 students)
1.	Verification of ohms and Kirchoff'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 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
5.	Characteristics of PN and Zener Diodes 1. PN Diode (BY127, OA79), Zener diode (6.8V, 1A) 2. Resistor 1 KΩ, 100Ω 3. Bread Board 4. DC Regulated Power supply (0 - 30 V variable) 5. Multimeter 6. Connecting wires	1 1 1 1 1 As Required
6.	Characteristics of BJT 1. Transistor (No-BC548) 2. Resistors- 1kΩ, 470KΩ, 1MΩ 3. Bread Board DC Regulated Power supply (0 - 30 V variable) 5. Multimeter 6. Connecting wires	1 1 1 1 1 As Required

	<p>Characteristics of SCR</p> <ol style="list-style-type: none"> 1. D C Power Supply (0□128 V), (0□32V), 2. Voltmeter (0□100V) 3. SCR TYN604 4. Digital multimeter 5. Ammeters (0□100mA, 0-25mA, 0-1mA) 6. Resistors 1KΩ, 1KΩ 7. Bread board 8. Connecting Wires <p>Characteristics of MOSFET</p> <ol style="list-style-type: none"> 1. MOSFET (2N7000) 2. Bread board 3. resistor (1KΩ, 100KΩ) 4. DC power supply (0-30V) 5. Multimeter 6. Bread board 7. Connecting Wires 	<p>1 1 1 1 1 1 As Required</p> <p>1 1 1 1 1 1 As Required</p>
7.	<p>Half wave and Full Wave rectifiers</p> <ol style="list-style-type: none"> 1. Diodes (Si-1N4007) – 4 2. Resistor 1KΩ 3. Capacitor 100μF 4. Digital Multimeter 5. CRO 6. Transformer (6-0-6)V 7. Bread Board 8. Connecting Wires 	<p>1 1 1 1 1 1 1 As Required</p>
8.	<p>Study of Logic Gates</p> <ol style="list-style-type: none"> 1. IC 7400, 7402, 7404,7408,7432,7486 2. Digital IC trainer 3. Patch chords 	<p>1 1 As Required</p>
9.	<p>Implementation of Binary Adder and Subtractor</p> <ol style="list-style-type: none"> 1. AND Gate IC 7408 2. X-OR Gate IC 7486 3. NOT Gate IC 7404 4. OR Gate IC 7432 5.. IC Trainer Kit 6. Patch Chords 	<p>1 1 1 1 1 As Required</p>

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(R 2021) Semester – III

ME3381 COMPUTER AIDED MACHINE DRAWING

Sl.No.	Description of Equipment	Required Numbers
1.	Intel Octa core i9 processor	6 GHz, 16 GB Ram, 600 s8D HD- 50
2.	Windows 11	50 S7D Acad License
3.	Creo 9.0	
4.	Solid Works 2023	
5.	Autodesk Inventor 2023.1.1	
6.	Auto CAD 2023	

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ME3382

MANUFACTURING TECHNOLOGY LABORATORY

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

S.No.	NAME OF THE 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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CE3481 STRENGTH OF MATERIALS AND FLUID MACHINERY LABORATORY

LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

Sl. No.	Name of the 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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ME3461 THERMAL ENGINEERING LABORATORY

LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

Sl. No.	Name of the Equipment	Required Numbers
1	I.C Engine – 2 stroke and 4 stroke model	1 set
2	Apparatus for Flash and Fire point	1 No.
3	4-stroke Diesel Engine with mechanical loading	1 No.
4	4-stroke Diesel Engine with hydraulic loading	1 No.
5	4-stroke Diesel Engine with electrical loading	1 No.
6	Multi-Cylinder Petrol Engine	1 No.
7	Single Cylinder Petrol Engine	1 No.
8	Data Acquisition system with any one of the above engines	1 No.
9	Steam Boiler with turbine setup	1 No.

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MS3511 METALLURGY LABORATORY

Sl.No.	Description of the Equipment	Required Numbers
1.	Mounting Press	1
2.	Belt Grinder	2
3.	Polishing table with row of flat slant metal plate to fix emery sheets	4
4.	Disc polishing equipment	2
5.	Abrasive Cutter	1
6.	Metallographic Microscope with image analyzer	4
7.	Heat treatment furnace	1
8.	Jominy End Quench test apparatus	1
9.	Hardness testing machine	1
10.	Sieve shaker with sieve set	1
11.	Permeability meter	1
12.	Moisture Tester	1
13.	AFS sand rammer, base block, base permeability tube, tube filler accessory.	1
14.	Clay washer	1
15.	Universal strength testing machine (Hydraulic)	1
16.	Electroplating equipment	1

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MS3611 COMPUTER AIDED ENGINEERING LABORATORY

Sl.No.	Description of the Equipment	Required Numbers
1.	Computer	30
2.	CAD Modelling Software	30
3.	FEA Analysis Software	30
4.	CFD Analysis Software	30

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ME3581

METROLOGY AND DYNAMICS LABORATORY

LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

METROLOGY

Sl. 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

Sl. 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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ME3681 CAD/CAM LABORATORY

Sl. No.	Name of the Equipment	Required Numbers
HARDWARE		
1	Computer Server	1 No.
2	Computer nodes or systems (High end CPU with atleast 1 GB main memory) networked to the server	30 Nos.
3	A3 size plotter	1 No.
4	Laser Printer	1 No.
5	CNC Lathe	1 No.
6	CNC Milling Machine	1 No.
SOFTWARE		
7	Any High end integrated modeling and manufacturing CAD / CAM software	15 licenses
8	CAM Software for machining centre and turning centre (CNC Programming and tool path simulation for FANUC / Sinumeric and Heidenhain controller)	15 licenses
9	Licensed operating system	Adequate
10	Support for CAPP	Adequate

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ME3682 HEAT TRANSFER LABORATORY

Sl. No.	Name of the Equipment	Required Numbers
1	Guarded plate apparatus	1 set
2	Lagged pipe apparatus	1 No.
3	Natural convection – vertical cylinder apparatus	1 No.
4	Forced convection inside tube apparatus	1 No.
5	Composite wall apparatus	1 No.
6	Thermal conductivity of insulating powder apparatus	1 No.
7	Pin-fin apparatus	1 No.
8	Stefan-Boltzmann apparatus	1 No.
9	Emissivity measurement apparatus	1 No.
10	Parallel/counter flow heat exchanger apparatus	1 No.
11	Single / two stage reciprocating air compressor	1 No.
12	Refrigeration test rig	1 No.
13	Air-conditioning test rig	1 No.

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SEMESTER IX

ME3781 MECHATRONICS AND IOT LABORATORY

LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS

Sl. No.	Name of the Equipment	Required Numbers
1	Basic Pneumatic Trainer Kit with manual and electrical controls / PLC Control each	1 No.
2	Basic Hydraulic Trainer Kit	1 No.
3	Hydraulic and Pneumatics Systems Simulation Software	10 Nos.
4	8051 – Microcontroller kit with stepper motor and drive circuit sets	2 Nos.
5	Image processing system with hardware & software	1 No.
6	MT Connect , Production Monitoring System	1 No
7	Six-Axis Articulated Robot	1 No
8	IoT based Home Automation kit	1No
9	Quadcopter	1 No
10	3D Printer	1 No
11	Machine Vision Kit	1 No
12	Solar-powered surveillance mobile robot	1 No
13	Electric Vehicle	1 No
14	GPS- and GSM-Based Vehicle Tracking Kit	1 No