Faculty of Mechanical Engineering

B.E. Manufacturing Engineering

(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 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 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

	Characteristics of SCR 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 **Characteristics of MOSFET** 1. MOSFET (2N7000) 2. Bread board 3. resistor (1KΩ, 100KΩ) 4. DC power supply (0-30V 5. Multimeter 6.Bread board 7. Connecting Wires	1 1 1 1 1 1 As Required 1 1 1 1 1 1 As Required
7.	**Half wave and Full Wave rectifiers** **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	 1 1 1 1 1 1 1 As Required
8.	**Study of Logic Gates** 1. IC 7400, 7402, 7404,7408,7432,7486 2. Digital IC trainer 3. Patch chords	 1 1 As Required
9.	**Implementation of Binary Adder and Subtractor** 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	 1 1 1 1 1 As Required

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B.E. Manufacturing Engineering

(R 2021) Semester – III

MF3311 STRENGTH OF MATERIALS AND METALLURGY LABORATORY

List of equipment's for Batch of 30 students

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

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(R 2021) Semester – III

MF3361 MACHINING TECHNOLOGY LABORATORY

List of equipment's for Batch of 30 students

Sl.No.	Description of Equipment	Required Numbers
1	Centre Lathes	7 Nos.
2	Horizontal Milling Machine	1 No
3	Vertical Milling Machine	1
4	Shaper	1
5	Arc welding transformer with cables and holders	2
6	Oxygen and acetylene gas cylinders, blow pipe and otherwelding outfit	1
8	Sheet metal forming tools and equipments	2
9	Turret and Capstan Lathes	1 No
11	Surface Grinding Machine	1 No.
12	Cylindrical Grinding Machine	1 No.
13	Radial Drilling Machine	1 No.
14	Lathe Tool Dynamometer	1 No
15	Milling Tool Dynamometer	1 No
16	Gear Hobbing Machine	1 No
17	Tool Makers Microscope	1 No
18	Gear Shaping machine	1 No
19	Centerless grinding machine	1 No
20	Tool and cutter grinder	1 No

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B.E. Manufacturing Engineering

(R 2021) Semester – III

MF3312 FLUID MACHINERY LABORATORY

List of equipment's for Batch of 30 students

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

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(R 2021) Semester – IV

MF3411 COMPUTER AIDED PRODUCT DESIGN AND ASSEMBLY LABORATORY

List of equipment's for Batch of 30 students

Sl. No.	Description of Equipment	Required Numbers
HARDWARE		
1.	Computer Server	1
2.	Computer nodes or systems (High end CPU with atleast 4GB main memory and with 4 GB Graphics) networked to the server	30
3.	A3 size plotter	1
4.	Laser Printer	1
SOFTWARE		
5.	Any High end integrated modeling and manufacturing CAD / CAM software	15 licenses

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(R 2021) Semester – IV

MF3412 CNC MACHINING LABORATORY

List of equipment's for Batch of 30 students

Sl.No.	Description of Equipment	Required Numbers
1	CNC Milling	1
2	CNC Wire Cut EDM	1
3	CNC Lathe	1
4	CNC EDM	1
5	CNC Simulation Kit	2
6	CAM Software for machining centre and turning centre (CNC Programming and tool path simulation for FANUC /Sinumeric and Heidenhain controller)	10 licenses

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(R 2021) Semester – V

MF3511 PLASTICS ENGINEERING LABORATORY

Sl. No.	Description of Equipment	Required Numbers
A.	**Processing Lab**	
1.	Hand Injection Moulding Machine	3
2.	Injection Moulding Machine	2
3.	Compression Moulding machine	1
4.	Blow Moulding Machine	1
5.	Extruder	1
B.	**Testing Lab**	
1.	Weighing balance with density measurement kit	1
2.	Bunsen burner	1
3.	Magnetic stirrer	1
4.	Injection Moulding machine with multi specimen mould inserts	1
5.	Two roll mill	1
6.	Compression moulding machine	1
7.	Contour cutter	1
8.	Templates for test specimens	1
9.	Punching tool and Press	1
10.	Universal Testing Machine	1
11.	Izod and Charpy impact tester	1
12.	Notch Cutter	1
13.	Durometer Hardness Tester – Shore A & Shore D Hardness tester – Rockwell & Barcol	1 each
14.	Melt Flow Indexer	1
15.	HDT / VST tester	1
16.	FTIR /DSC/TGA	1 each
17.	Arc resistance tester Teraohm meter Guarded Electrode for Surface and Volume resistivity measurements LCR meter – Dielectric constant tester	1 each

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(R 2021) Semester – V

MF3513 METROLOGY AND COMPUTER AIDED INSPECTION LABORATORY

List of equipment's for Batch of 30 students

Sl.No.	Description of Equipment	Required Numbers
1.	Autocollimator & Reflector and a straight edge or straightcomponent	1 each
2.	Gear Tester, Master gear & test gear (s)	1 each
3.	Comparator(Mechanical, Optical, Electrical), samples & slip gauge set	1 each
5.	Sine bar, tapered component, dial indicator	1 each
6.	Bevel protractor & samples	1 each
7.	Roughness tester (Contact & Non contact), machined samples	1 each
8.	Tool Makers Microscope & samples, suitable screw threads	1 each
9.	Coordinate Measuring Machine & accessories	1 each
10.	Gear tooth Vernier Caliper & a suitable master gear	1 each
11.	Video Measuring System	1

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B.E. Manufacturing Engineering

(R 2021) Semester – VI

MF3611 COMPUTER AIDED SIMULATION AND ANALYSIS LABORATORY

Sl.No.	Description of Equipment	Required Numbers
Hardware		
1.	Computers with necessary accessories	30 nos.
2.	Printer	1
Software		
1.	Any Commercially available Finite element analysis software with preprocessor, solver & post processor	30 licenses
2.	MATLAB Software (Basic modules) or otherequivalent software	Min 5 license

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B.E. Manufacturing Engineering

(R 2021) Semester – VI

MF3681 MECHATRONICS LABORATORY

List of equipment's for Batch of 30 students

Sl.No.	Description of Equipment	Required Numbers
1	Basic Pneumatic Trainer Kit with manual and electrical controls/ PLCControl each	1
2	Basic Hydraulic Trainer Kit	1
3	Hydraulics and Pneumatics Systems Simulation Software	10
4	8051 - Microcontroller kit with stepper motor and drive circuit sets	2
5	Image processing system with hardware & software	1
6	Robot Simulation software	1

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B.E. Manufacturing Engineering

(R 2021) Semester – VII

MF3711 ADDITIVE MANUFACTURING LABORATORY

Sl.No.	Description of Equipment	Required Numbers
1.	Solid Based 3D Printer	1
2.	Liquid Based 3D printer	1
3.	Powder Based 3D printer - Polymer	1
4.	Powder Based 3D printer - Metal	1
5.	Support removal System	1
6.	Sand blasting	1
7.	3D Printing software	1 (Each 3D printing technology)