Faculty of Mechanical Engineering

B.E. Material Science and 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.	**Three Phase Power Measurement** 1. Three Phase Variable Load, 2. Ammeters 0-10 A, MI, 3. Wattmeters 0-5 A, 300V, **4.** Voltmeter 0-300v,MI **5.** Connecting wires	 1 2 2 1 As Required
3.	**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 7. DC Shunt Motor	 1 1 1 1 1 As Required 1
4.	**Load test on Self Excited DC Generator** 1.Voltmeter(0-300v) 2. Ammeter (0-30 A), (0-2A) 3. Voltmeter (0-30V) 4. Rheostat 175Ω, 250 Ω 5. Tachometer 6. Connecting Wires 7. DC Shunt Motor coupled with DC shunt Generator	 1 1 1 1 1 As Required 1
5.	**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
6.	**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

7.	**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
8.	**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 **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. Connecting Wires	 1 1 1 1 1 As Required 1 1 1 1 1 1 As Required 1 1 1 1 1 1 As Required
9.	**Design and analysis of 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
10.	**Measurement of displacement of LVDT** 1. LVDT Kit 2. Multimeter	 1 1

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(R 2021) Semester – III

ML3311 MICROSTRUCTURAL ANALYSIS LABORATORY

Sl.No.	Description of Equipment	Required Numbers
1.	Mounting Press	2
2.	Belt Grinder	2
3.	Polishing Table with row of flat slant metal plate to fic emery sheets	6
4.	Disc polishing equipment	4
5.	Abrasive Cutter	2
6.	Metallographic Microscope with image analyzer	6
7.	Etchant	Sufficient quantity
8.	Alumina Powder	
9.	Distilled water	
10.	Emery papers	
11.	Velvette polishing cloth	
12.	Mounting material	

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(R 2021) Semester – III

CE3312 STRENGTH OF MATERIALS LABORATORY

Sl.No.	Description of Equipment	Required Numbers
1.	UTM of minimum 400 kN capacity	1
2.	Torsion testing machine	1
3.	Izod impact testing machine	1
4.	Hardness testing machine Rockwell	1
5.	Vicker's / Brinnel	1
6.	Beam deflection test apparatus	1
7.	Extensometer	1
8.	Compressometer	1
9.	Dial gauges	1
10.	Le Chatelier's apparatus	2
11.	Vicat's apparatus	2
12.	Mortar cube moulds	10

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(R 2021) Semester – IV

ML3411 MATERIALS CHARACTERIZATION LABORATORY

Sl.No.	Description of Equipment	Required Numbers
1.	UV-Visible Spectrophotometer	1
2.	Dilatometer	1
3.	Conductivity meter	1
4.	Infrared Spectrophotometer	2
5.	Thin Film Chromatography	1
6.	DSC-TGA Analyser	1
7.	Electro Microscope	1
8.	Cuvette	4
9.	Pipette	2
10.	Tweezers	4
11.	Crucibles	4
12.	Potassium Permanganate Powder	Sufficient Quantity
13.	Distilled Water	
14.	Adsorbent material	
15.	Nitro Aniline-Ortho and Para	

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(R 2021) Semester – IV

ML3412 HEAT TREATMENT LABORATORY

Sl.No.	Description of Equipment	Required Numbers
1.	Heat Treatment furnace	2
2.	Jominy End Quench test apparatus	1
3.	Hardness testing machine	2
4.	Optical microscope with image analyzer	4
5.	Tongs	2
6.	Gloves	2 sets
7.	Crucibles	4
8.	MS Rods	Sufficient Quantity
9.	Emery Sheets	
10.	Alumina Powder	
11.	Etchant	
12.	Quenchant	

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(R 2021) Semester – V

ML3512 METAL AND POWDER FORMING LABORATORY

Sl.No.	Description of Equipment	Required Numbers
1.	Ericson Cup test machine	1
2.	Three roll mill	1
3.	Hydraulic press 60T	1
4.	Extrusion die - cold	2
5.	FEA software	5 license
6.	Ball mill	1
7.	Density meter	1
8.	Compaction press	1
9.	Sintering machine	1
10.	Weight Balance	2
11.	Sieve Shaker	1
12.	Vernier Caliper	2
13.	Aluminum sheet	Sufficient Quantity
14.	Aluminum Rods	
15.	Steel sheet	

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(R 2021) Semester – VI

ML3611 FOUNDRY AND WELDING LABORATORY

Sl. No.	Description of Equipment	Required Numbers
1.	Sieve shaker with sieve set	1
2.	Permeability meter	1
3.	Moisture Tester	1
4.	AFS sand rammer, base block, base permeability tube, tube filler accessory	2
5.	Clay washer	1
6.	Universal strength testing machine (Hydraulic)	1
7.	Scratch hardness tester	1
8.	Compactablity specimen tube, Compactability scale	1
9.	Moulding box with patterns	1
10.	Sand mixer	1
11.	TIG	1
12.	MIG	1
13.	Optical Microscope	2

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ML3711 NON-DESTRUCTIVE TESTING LABORATORY

Sl. No.	Description of Equipment	Required Numbers
1.	Liquid penetrant tester	1
2.	Magnetic particle tester	1
3.	Radiographic film	2
4.	Ultrasonic tester	1
5.	Infrared thermal imaging camera	1
6.	Dye	Sufficient Quantity
7.	Penetrant	
8.	Cleaner	
9.	Magnetic particles	