

**Faculty of Mechanical Engineering**  
**B.E. Material Science and Engineering**  
**(R 2021) Semester – II**

<b>Course Code: BE3271 Course Title: Basic Electrical and Electronics Engineering Laboratory</b>		
<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required numbers (for batch of 30 students)</b>
<b>1.</b>	<b>Verification of ohms and Kirchoff's Laws</b> 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
<b>2.</b>	<b>Load test on DC Shunt Motor</b> 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
<b>3.</b>	<b>Load test on Self Excited DC Generator</b> 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
<b>4.</b>	<b>Load Test on Induction Motor</b> 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
<b>5.</b>	<b>Characteristics of PN and Zener Diodes</b> 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
<b>6.</b>	<b>Characteristics of BJT</b> 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><b>Characteristics of SCR</b></p> <ol style="list-style-type: none"> <li>1. D C Power Supply (0□128 V), (0□32V ),</li> <li>2. Voltmeter (0□100V)</li> <li>3. SCR TYN604</li> <li>4. Digital multimeter</li> <li>5. Ammeters (0□100mA, 0-25mA, 0-1mA)</li> <li>6. Resistors 1KΩ, 1KΩ</li> <li>7. Bread board</li> <li>8. Connecting Wires</li> </ol> <p><b>Characteristics of MOSFET</b></p> <ol style="list-style-type: none"> <li>1. MOSFET (2N7000)</li> <li>2. Bread board</li> <li>3. resistor (1KΩ, 100KΩ)</li> <li>4. DC power supply (0-30V)</li> <li>5. Multimeter</li> <li>6. Bread board</li> <li>7. Connecting Wires</li> </ol>	<p>1 1 1 1 1 1 As Required</p> <p>1 1 1 1 1 1 As Required</p>
7.	<p><b>Half wave and Full Wave rectifiers</b></p> <ol style="list-style-type: none"> <li>1. Diodes (Si-1N4007) – 4</li> <li>2. Resistor 1KΩ</li> <li>3. Capacitor 100μF</li> <li>4. Digital Multimeter</li> <li>5. CRO</li> <li>6. Transformer (6-0-6)V</li> <li>7. Bread Board</li> <li>8. Connecting Wires</li> </ol>	<p>1 1 1 1 1 1 1 As Required</p>
8.	<p><b>Study of Logic Gates</b></p> <ol style="list-style-type: none"> <li>1. IC 7400, 7402, 7404,7408,7432,7486</li> <li>2. Digital IC trainer</li> <li>3. Patch chords</li> </ol>	<p>1 1 As Required</p>
9.	<p><b>Implementation of Binary Adder and Subtractor</b></p> <ol style="list-style-type: none"> <li>1. AND Gate IC 7408</li> <li>2. X-OR Gate IC 7486</li> <li>3. NOT Gate IC 7404</li> <li>4. OR Gate IC 7432</li> <li>5.. IC Trainer Kit</li> <li>6. Patch Chords</li> </ol>	<p>1 1 1 1 1 As Required</p>

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**(R 2021) Semester – III**

**ML3311 MICROSTRUCTURAL ANALYSIS LABORATORY**

<b>Sl.No.</b>	<b>Description of Equipment</b>	<b>Required Numbers</b>
1.	Mounting Press	2
2.	Belt Grinder	2
3.	Polishing Table with row of flat slant metal plate to fix 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.	Velvete polishing cloth	
12.	Mounting material	

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**CE3312 STRENGTH OF MATERIALS LABORATORY**

<b>Sl.No.</b>	<b>Description of Equipment</b>	<b>Required Numbers</b>
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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**ML3411 MATERIALS CHARACTERIZATION LABORATORY**

<b>Sl.No.</b>	<b>Description of Equipment</b>	<b>Required Numbers</b>
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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**ML3412 HEAT TREATMENT LABORATORY**

<b>Sl.No.</b>	<b>Description of Equipment</b>	<b>Required Numbers</b>
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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**ML3512 METAL AND POWDER FORMING LABORATORY**

<b>Sl.No.</b>	<b>Description of Equipment</b>	<b>Required Numbers</b>
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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**ML3611 FOUNDRY AND WELDING LABORATORY**

<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required Numbers</b>
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.	Compactability 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**

<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required Numbers</b>
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	