Faculty of Mechanical Engineering

B.E. Production 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. Production Engineering

(R 2021) Semester – III

PR3311 METALLURGY AND MATERIALS TESTING LABORATORY

Requirements for a batch of 30 Students

Sl.No.	Description of Equipment	Required Numbers
	METALLURGY LAB	
1	Jominy End Quench Test	1
2	Specimen Mounting Test with Digital Measurements	1
3	Trinocular Microscopes with Objective Lens	2
4	Disc Polishing Machine	2
5	Muffle Furnace	1
6	Optical Microscope with Image Analyzing Software	1
7	Micro Vickers Hardness Tester	1
8	Printer to print the Microstructure	1
9	Cooling Curve Equipment	1
	MATERIALS TESTING LABORATORY	
1	Universal Tension Testing machine with double 1 shear attachment – 40 Ton	1
2	Torsion testing machine (60 NM Capacity)	1
3	Impact testing machine (300 J Capacity)	1
4	Spring testing machine for Tensile and Compressive loads (2500 N)	1
5	Fatigue testing machine	1
6	Creep testing machine	1
7	Pin on disk wear test setup	1
8	Brinell hardness testing machine	1
9	Rockwell hardness testing machine	1

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(R 2021) Semester – IV

PR3411 FOUNDRY AND WELDING LABORATORY

Requirements for a batch of 30 Students

Sl.No.	Description of Equipment	Required Numbers
	FOUNDRY LAB	
1	5 kg Muller	1
2	Sand rammer	1
3	Weighting balance	1
4	Universal sand strength testing with all accessories	1
5	Permeability tester	1
6	Quick moisture tester	1
7	Infra-red drier	1
8	Sieve shaker with Sieves	1
9	Crucible furnace	1
10	Oxy acetylene gas welding equipment	1
11	Clay content tester	1
	WELDING LABORATORY	
1	Arc welding equipment	1
2	GTAW equipment	1
3	GMAM equipment	1
4	Spot welding equipment	1
5	Brazing equipment	1

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(R 2021) Semester – IV

PR3412 DYNAMICS OF MACHINES LABORATORY

Requirements for a batch of 30 Students

Sl.No.	Description of Equipment	Required Numbers
1	Working gear models (including gear trains)	1
2	Working kinematics mechanism (four bar chain, slider-crank mechanism, rocker-rocker mechanism, crank-rocker mechanism, double crank mechanism, Oldham coupling, and Hooke's joint)	1
3	Double end connecting rod apparatus	1
4	Turn table apparatus	1
5	Compound pendulum and bifilar suspension	1
6	Motorized gyroscope	1
7	Universal governor apparatus (Watt, Porter, Proell and Hartnell governer)	1
8	Cam follower setup	1
9	Spring mass vibration system	1
10	Spring mass vibration system with damper	1
11	Single and double rotor system	1
12	Whirling of shaft apparatus	1
13	Balancing of Rotating Masses	1
14	Balancing of Reciprocating Masses	1
15	Transverse vibration setup (a) Cantilever beam	1
	(b) Free-Free beam	1
	(c) Simply supported beam	1

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(R 2021) Semester – V

PR3512 FLUID POWER SYSTEMS LABORATORY

Requirements for a batch of 30 Students

Sl.No.	Description of Equipment	Required Numbers
1	Working Pneumatic and Hydraulic Models	1
2	Hydraulic Trainer	1
3	Electro Hydraulic Trainer	1
4	Hydraulic Accumulator Intensifier, Press.	1
5	Transparent Hydraulic and Pneumatic Trainer	1
6	Pneumatic Trainer	1
7	Electro Pneumatic Trainer	1
8	PLC Based Pneumatic Trainer	1
9	Simulation software for Pneumatic and Hydraulic Circuits	1

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(R 2021) Semester – V

PR3513 ENGINEERING METROLOGY LABORATORY

Requirements for a batch of 30 Students

S.No	Description of the equipment	Required numbers
1	Dial gauge Lc 10 micrometer	01
2	Dial gauge Lc 0.2 micrometer	01
3	Dial stand	01
4	Sine Bar 100 mm	01
5	Sine Bar 200 mm	01
6	Bevel protractor	01
7	Gear tooth vernier	01
8	Precision rollers 8	01
9	Precision spears different dia	01
10	Vernier caliper 0-150 mm	01
11	Vernier caliper 0-300 mm	01
12	Digital Vernier caliper 0-150 mm	01
13	Micrometer 0-25 mm	01
14	Micrometer 25-50 mm	01
15	Micrometer 50-75 mm	01
16	Digital Micrometer	01
17	Height Gauge Analog	01
18	Height Gauge Digital	01
19	Slip gauge set	01
20	Depth vernier	01
21	Thread plug gauge m24 x 3	01
22	Thread plug gauge m20 x 2.5	01
23	3 Wire set box	01
24	Surface roughness measuring instrument	01
25	Dial gauge to be calibrated	01
26	Precision level	01
27	Precision spear	01
28	Telescopic gauge	01

29	Bore dial gauge 16-35, 35-60	01
30	Master dial gauge	01
31	CMM	01
32	Vision measuring system	01
33	Depth Vernier 0-150 mm	01
34	Depth micrometer with 6 rods	01
35	V-Block	01
36	Bench Centre	01
37	Pitch gauge	01
38	Profile Projector	01
39	Toolmakers Microscope	01
40	Surface plate	01

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B.E. Production Engineering

(R 2021) Semester – VI

PR3611 METAL FORMING LAB AND SPECIAL MACHINE LABORATORY

Requirements for a batch of 30 Students

Sl.No.	Description of Equipment	Required Numbers
	METAL FORMING LAB	
1	Universal Testing Machine 10T	1
2	Erichsen Cupping Tester	1
3	Hydraulic Press 50T	1
4	FLD Setup	
5	Ring Compression Tester	1
6	Water Hammer Forming Setup	1
7	Two High Rolling Mill Setup with Power Consumption Measuring Setup	1
8	Muffle Furnace 1200^{O}C	1
9	Superplastic Forming Setup	
10	Deep Drawing Die Setup	1
11	Extrusion Die Setup	1
12	Micro-Forming Die Setup	1
13	Metal Forming Simulation Software	1
	SPECIAL MACHINE LABORATORY	
1	Gear Hobbing machine	1
2	Milling Machine with Spur Gear and Helical Gear Cutting Arrangement	1
3	Planner machine	1
4	Centreless Cylindrical Grinding Machine	1
5	Tool and Cutter Grinding Machine	1

6	Tool Wear Measuring Setup	1
7	Machine Tool Acceptance Test Setup as Per ISI Test Chart	1
8	Electrical Discharge Machine	1
9	Capstan and Turret Lathe Machine	1
10	Milling Tool Dynamometer	1
11	Lathe Tool Dynamometer	1

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B.E. Production Engineering

(R 2021) Semester – VI

PR3612 CAD AND CAM LABORATORY

Requirements for a batch of 30 Students

Sl.No.	Description of Equipment	Required Numbers
	CAD Lab	
1	2D Modelling Software	30
2	3D Modelling Software	30
3	High End Computer with necessary Accessories	30
4	Printer	1
	CAM LABORATORY	
1	CNC Lathe / Turning Centre	1
2	CNC Milling Machine / Machining Centre	1
3	Simulation of CNC Wire EDM	1