Faculty of Civil Engineering

B.E. Environmental Engineering

(R2021) Semester: II

Course Code: BE3272
Course Title: Basic Electrical, Electronics and Instrumentation 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)	1
	2. Bread Board	1
	3. Resistors	As per Circuit diagram
	4. Multimeter	1
	5. Connecting wires	As Required
2.	**Three Phase Power Measurement**	
	1. Three Phase Variable Load,	1
	2. Ammeters 0-10 A, MI,	2
	3. Wattmeters 0-5 A, 300V,	2
	4. Voltmeter 0-300v,MI	1
	5. Connecting wires	As Required
3.	**Load test on DC Shunt Motor.**	
	1. Ammeter MC (0-20A)	1
	2. Voltmeter MC (0-300)V	1
	3. Rheostat 7.5 Ω, 10 A	1
	4. Tachometer	1
	5. Field Rheostat 175 Ω, 1.5 A	1
	6. Connecting wires	As Required
4.	**Load test on Self Excited DC Generator**	
	1. DC shunt generator(0- 300V)	**1**
	2. Ammeter (0-30 A), (0-2A)	**1**
	3. Voltmeter (0-30V)	**1**
	4. Rheostat 175Ω, 250 Ω	**1**
	5. Tachometer	**1**
	6. Connecting Wires	As Required
5.	**Load test on Single phase Transformer**	
	1. Ammeter (0-30) A, (0-5) A	**1**
	2. Voltmeter (0-150)V, (0-300)V	**1**
	3. Wattmeter – 300V, 5A, UPF	**1**
	4. Autotransformer	**1**
	5. Single phase Transformer	**1**
	6. Connecting Wires	As Required
6.	**Load Test on Induction Motor**	
	1. Ammeter MI (0-20A)	1
	2. Voltmeter MI (0-300)V	1
	3. Wattmeter – 300V, 30 A	1
	4. Tachometer – Digital	1
	5. Connecting Wires	As Required
	6. Single phase Induction motor	1
7.	**Characteristics of PN and Zener Diodes**	
	1. PN Diode (BY127, OA79), Zener diode (6.8V, 1A)	1
	2. Resistor 1 KΩ, 100Ω	1

	3. Bread Board 4. DC Regulated Power supply (0 - 30 V variable) 5. Multimeter 6. Connecting wires	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.Bread board 7. 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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(R2021) Semester: III

EN3311 ENVIRONMENTAL FLUID MECHANICS LABORATORY

Sl. No.	Description of Equipment	Required numbers
1.	Rotameter setup	**1 no**
2.	Venturimeter setup	**1 no**
3.	Orificemeter setup	**1 no**
4.	Bernoulli's setup	**1 no**
5.	Triangular / Rectangular notch (with a lined open channel setup)	**1 no**
6.	Friction apparatus setup	**1 no**
7.	Pipe setup with bends, fittings and elbows for estimating minor losses	**1 no**
8.	Centrifugal pump assembly	**1 no**
9.	Reciprocating pump assembly	**1 no**
10.	Submersible pump assembly	**1 no**
11.	Stop watch	**15 nos**
12.	Wooden scale	**1 no**

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(R2021) Semester: IV

EN3411 ENVIRONMENTAL CHEMISTRY AND MICROBIOLOGY LABORATORY

Sl. No.	Description of Equipment	Required numbers
1.	**Determination of Hardness in Water Sample by Volumetric Titration**	
	1. Burette	6
	2. Pipette	6
	3. Conical Flask	6
	4. Beaker	6
	5. Volumetion Flask (1000ml)	6
	6. Volumetion Flask (25ml/50ml)	6
2.	**Estimation Of Chloride in Water Sample by Volumetric Titration**	
	1. Burette	6
	2. Pipette	6
	3. Conical Flask	6
	4. Beaker	6
	5. Volumetion Flask (1000ml)	6
	6. Volumetion Flask (25ml/50ml)	6
3.	**Determination of Sulphate**	
	1. Spectrophoto meter UV/vis	1
	2. Cuvette	1 Set
	3. Pipette & Bulb	2
	4. Beakers	As Required
	5. Volumetion Flask (1000ml)	1
	6. Volumetion Flask (25ml/50ml)	7
4.	**Determination of Phosphate**	
	1. Spectrophoto meter UV/vis	1
	2. Cuvette	1 Set
	3. Pipette & Bulb	2
	4. Beakers	As Required
	5. Volumetion Flask (1000ml)	1
	6. Volumetion Flask (25ml/50ml)	7
5.	**Determination of Total Solids, Total Suspended Solids, Total Dissolved Solids**	
	1. Filter Paper	10
	2. Crucibles	6
	3. Oven	1
	4. Conical Flask	5
	5. Beakers	5
6.	**Estimation of COD**	
	1. Refluming Apparatus	1
	2. Conical Flask (250ml)	2
	3. Burette	2
	4. Pipette & bulb (5ml)	2
	5. Measuring cylinder (50ml)	1
	6. Beakers	AS Required

7.	**Estimation of BOD in Waste water Sample** 1. BOD bottles (300ml) 2. Incubator Electrical 3. Burette 4. Conical Flask (250ml) 5. Measuring cylinder (50ml) 6. Beakers	 6 1 2 2 1 As Required

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(R2021) Semester: V

EN3511 ENVIRONMENTAL ENGINEERING LABORATORY

Sl. No.	Description of Equipment	Required numbers
1.	Electrical conductivity Metre	**1 no**
2.	Turbidity metre	**1 no**
3.	Beaker	**20 (Size as required)**
4.	Spectrophoto meter UV/vis-	**1 no**
5.	Cuvette	**2 no**
6.	Pipette & Bulb	**20+20**
7.	Volumetion Flask (1000ml)	**5**
8.	Volumetion Flask (25ml/50ml)	**5/5**
9.	Jar test apparatus	**1**
10.	one litre beakers	**10**
11.	Burette	**20**
12.	Whatmann Filter Paper	
13.	Conical flask	**20**
14.	Crucibles	**20**
15.	Hot air Oven	**1**
16.	Muffle furnace	**1**
17.	Imhoff cone BOD bottles (300ml)	**2** **20 bottles**
18.	BOD Incubator Electrical	**1**
19.	Conical Flask (250ml)	**10**
20.	Measuring cylinder (50ml)	**5**
21.	Measuring cylinder (100ml) COD apparatus	5(as size required)
22.	Test tubes	**30**
23.	Petridish	**10**
24.	pH metre	**1**

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(R2021) Semester: V

EN3512 ENVIRONMENTAL ENGINEERING DESIGN AND DRAWING

Degree: UG	**Name of the Course: B. E. ENVIRONMENTAL ENGINEERING**	
Sl. No.	**Description of Equipment**	**Required numbers**
1.	Drawing table	As required

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(R2021) Semester: VI

EN3611 ENVIRONMENTAL INSTRUMENTATION LABORATORY

Sl. No.	Description of Equipment	Required numbers
1.	Sampling equipment's for soil and water	**2**
2.	Bench top pH meters	**2**
3.	Dissolved Oxygen Meter.	**1**
4.	TDS (Total Dissolved Solids metre)	**1**
5.	Spectrophotometer	**1**
6.	Atomic Absorption Spectrometer (AAS)	**1**
7.	Gas chromatography	**1**
8.	High Performance Liquid Chromatography. (HPLC)	**1**
9.	Flame Photometer	**1**
10.	Field model : pH, DO and TDS meter	**1**
11.	High Volume Sampler	**1**