

Faculty of Civil Engineering
B.Tech. AGRICULTURAL 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 Kirchoff'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 175 Ω , 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 6. Single phase Induction motor	1 1 1 1 As Required 1
7.	Characteristics of PN and Zener Diodes	

	<ol style="list-style-type: none"> 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 	<p style="text-align: center;">1 1 1 1 1 As Required</p>
8.	<p style="text-align: center;">Characteristics of BJT</p> <ol style="list-style-type: none"> 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 <p style="text-align: center;">Characteristics of SCR</p> <ol style="list-style-type: none"> 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 <p style="text-align: center;">Characteristics of MOSFET</p> <ol style="list-style-type: none"> 1. MOSFET (2N7000) 2. Bread board 3. resistor (1KΩ, 100KΩ) 4. DC power supply (0-30V) 5. Multimeter 6. Connecting Wires 	<p style="text-align: center;">1 1 1 1 1 As Required</p> <p style="text-align: center;">1 1 1 1 1 1 As Required</p> <p style="text-align: center;">1 1 1 1 1 As Required</p>
9.	<p style="text-align: center;">Design and analysis of Half wave and Full Wave rectifiers</p> <ol style="list-style-type: none"> 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 	<p style="text-align: center;">1 1 1 1 1 1 1 As Required</p>
10.	<p style="text-align: center;">Measurement of displacement of LVDT</p> <ol style="list-style-type: none"> 1. LVDT Kit 2. Multimeter 	<p style="text-align: center;">1 1</p>

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(R2021) Semester: III

Course Code: AI3311		Course Title: FLUID MECHANICS LABORATORY
Sl. No.	Description of Equipment	Required numbers
1.	Rotameter	1 no
2.	Venturimeter	1 no
3.	Orificemeter	1 no
4.	Pitot tube	1 no
5.	Bernoulli's theorem apparatus	1 no
6.	Triangular notch (with a lined open channel setup)	1 no
7.	Rectangular notch (with a lined open channel setup)	1 no
8.	Coefficient of friction apparatus	1 no
9.	Pipe setup with bends, fittings and elbows for estimating minor losses	1 no
10.	Fittings and elbows for estimating minor losses	1 no
11.	Centrifugal pump	1 no
12.	Reciprocating pump	1 no
13.	Submersible pump	1 no
14.	Collecting tank	1 for each experiment
15.	Stop watch	

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(R2021) Semester: III

Course Code: AI3312		Course Title: SOIL SCIENCE LABORATORY
Sl. No.	Description of Equipment	Required numbers
1.	Identification of rocks and minerals	1 no
2.	Collection and processing of soil samples	1 no
3.	Determination of soil moisture, EC and pH	2 nos
4.	Field density determination by Core Cutter and Sand Replacement method	2 nos
5.	Specific gravity determination by Pycnometer	2 nos
6.	Textural analysis of soil by International Pipette method	2 nos
7.	Grain size analysis by using Mechanical shaker	2 nos
8.	Determination of Organic carbon	Required nos
9.	Estimation of Gypsum requirements	Required nos.

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(R2021) Semester: IV

Course Code: AI3411 Course Title: TRACTORS AND FARM ENGINES LABORATORY		
Sl. No.	Description of Equipment	Required numbers
1.	Working model of diesel engine	1 no
2.	Working model of petrol engine	1 no
3.	Working model of clutch	1 no
4.	Working model of gear box	1 no
5.	Working model of differential	1 no
6.	Working model of final drive	1 no
7.	Working model of brake system	1 no
8.	Working model of steering system	1 no
9.	Condemned tractor	1 no
10.	Condemned diesel engine	1 no
11.	Condemned petrol engine	1 no

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B.Tech. AGRICULTURAL ENGINEERING
(R2021) Semester: IV

Course Code: AI3412 Course Title: 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 } Vicker's } (any 2)	1 each
5.	Beam deflection test apparatus	1
6.	Extensometer	1
7.	Compressometer	1
8.	Dial gauges	Few
9.	Le Chatelier's apparatus	2
10.	Vicat's apparatus	2
11.	Mortar cube moulds	10

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(R2021) Semester: V

Course Code: AI3511		Course Title: FARM MACHINERY LABORATORY
Sl. No.	Description of Equipment	Required numbers
1.	Tractor	1 no.
2.	Power tiller	1 no.
3.	Disc plough	1 no.
4.	Mould Board Plough	1 no.
5.	Disc harrow	1 no.
6.	Multi tyne cultivator	1 no.
7.	Paddy Transplanter	1 no.
8.	Seed drill	1 no.
9.	Sprayer	1 no.
10.	Mower	1 no.
11.	Weeder.	1 no.
12.	Combine harvester.(optional) – can be had as demonstration	1 no.
13.	Paddy Thresher (optional) - can be had as demonstration	1 no.

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Course Code: AI3512

Course Title: ICT IN AGRICULTURAL ENGINEERING LABORATORY

Sl. No.	Description of Equipment	Required numbers
1.	Nil	-

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(R2021) Semester: VI

Course Code: AI3611		Course Title: CAD FOR AGRICULTURE MACHINERY LAB
Sl. No.	Description of Equipment	Required numbers
1.	AUTOCAD Software Package	1 No

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B.Tech. AGRICULTURAL ENGINEERING
(R2021) Semester: VI

Course Code: AI3612
Course Title: POST – HARVEST TECHNOLOGY LABORATORY

Sl. No.	Description of Equipment	Required numbers
1.	Hot air oven, Grain moisturemeter	1 no. each
2.	Porosity apparatus	1 no.
3.	Coefficient of friction apparatus	1 no.
4.	Angle of repose – round type and L type	1 no. each
5.	Paddy thresher	1 no
6.	Groundnut decorticator and maize sheller	1 no. each
7.	Thin layer dryer	1 no
8.	LSU dryer	1 no
9.	Bucket elevator	1 no
10.	screw conveyer	1 no
11.	Rubber roll sheller	1 no
12.	Oil expeller	1 no

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Course Code: AI3613		Course Title: IRRIGATION FIELD LABORATORY
Sl. No.	Description of Equipment	Required numbers
1.	Meteorological lab with Cup counter anemometer, Sunshine recorder, Open pan evaporimeter, Stevenson's screen - Dry bulb, wet bulb thermometers, maximum and minimum temperature thermometers recording and non-recording type rain gauge etc.	each 1 no.
2.	Double ring infiltrometer	1 no.
3.	Digital infiltrometer	1 no.
4.	Parshall flume, cut throat flume	1 no.
5.	V notch, Rectangular notch and trapezoidal notch	1 no.
6.	Drip irrigation system with all accessories (both inline and outline)	1 set
7.	Sprinkler irrigation system with all accessories	1 set
8.	Stop watches	As required
9.	Weighing balance	1 no.
10.	Catch cans, measuring jars	As required
11.	Disc filter (any capacity)	1 no.

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(R2021) Semester: VII

Course Code: AI3711 Course Title: REMOTE SENSING AND GIS LABORATORY		
Sl. No.	Description of Equipment	Required numbers
1.	QGIS Software	30 Nos
2.	Desktop Computer with i7 processor or equivalent, 16GB Ram, 2GB Graphics card, 24" monitor	30 Nos
3.	Aerial Photos and Satellite images	15 Nos
4.	Topo Maps	15 Nos
5.	Pocket stereoscope with Accessories	15 Nos
6.	Parallax Bar	15 Nos
7.	Mirror Stereoscope	15 Nos
8.	Light table A0 size	6 nos

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Course Code: AI3712
Course Title: RENEWABLE ENERGY IN AGRICULTURAL ENGINEERING
LABORATORY

Sl. No.	Description of Equipment	Required numbers
1.	Hot air oven	1 no.
2.	Muffle furnace	1 no.
3.	Junkers gas calorimeter	1 no.
4.	Bomb calorimeter	1 no.
5.	Model of Biogas and Deenabandhu biogas plant	1 no.
6.	Biogas scrubbing unit	1 no.
7.	Gasifier - Lab Scale	1 no.
8.	Pyrolysis unit	1 no.
9.	Biogas/ Producer gas dual fuel Engine	1 no.
10.	Briquetting Machine - Lab Scale	1 no.
11.	Automatic weather station	1 no.
12.	Solar water heater-	1 no.
13.	Solar dryer	1 no.
14.	Solar PV training kit	1 no.
15.	Solar PV water pumping system	1 no.
	*The equipment includes the basic requirements like petri plates, silica crucible with lid, weighing balance, tongs, gloves, solarimeter, hand held anemometer, temperature and humidity sensor	