

**Faculty of Electrical Engineering**  
**B.E. Instrumentation and Control Engineering**  
**(R 2021) Semester – II**

<b>Course Code: EE3271</b>		<b>Course Title: Electric Circuits Laboratory</b>	
<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required numbers (for batch of 30 students)</b>	
1	10 Nos of PC loaded with Pspice/ Matlab/e-Sim / Scilab/ Equivalent Software Package	Minimum 10 Users	
2	Printer	1	
3	Regulated Power Supply (0-30V )	15 Nos	
4	Function Generator (MHz Range)	5 Nos	
5	Oscilloscope (20 MHz)	10 Nos	
6	Digital Storage Oscilloscope (20 MHz)	2 Nos	
7	AC/DC – Voltmeters of required rating	10 Nos	
8	AC/DC -Ammeters of required rating	10 Nos	
9	Multimeters	10 Nos	
10	Decade Resistance Box, Decade Inductance Box, Decade Capacitance Box	6 Nos each.	
11	Single Phase Wattmeter of suitable rating	5 Nos	
12	Circuit Connection Boards -	20 Nos	
13	Connecting Wires	Necessary Quantity	
14	Three phase star& delta connected load / Single phase load bank of suitable rating	3 Nos	
15	Necessary Quantities of Resistors, Inductors, Capacitors of various capacities (Quarter Watt to 10 Watt)		

<b>Degree: UG</b>		
<b>Name of the Course: B. E. INSTRUMENTATION AND CONTROL ENGINEERING</b>		
<b>Course Code:EI3361</b>		
<b>Course Title: SEMICONDUCTOR DEVICES AND CIRCUITS LABORATORY (R 2021) Semester: III</b>		
<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required numbers (for batch of 30 students)</b>
1	Regulated Power Supply – Dual, 0-30V, variable	10
2	Cathode Ray Oscilloscope, 0-30 MHz	8
3	Digital Multimeter	10
4	Function Generator, 0 – 20 MHz	8
5	Breadboard	10
6	Computer with PSIM/SIMULINK	1(Licensed)
7	PN Junction diode – 1N4007	20
8	Zener diode – FZ5.6 / FZ9	10
9	BJT – BC107 / BC547	10
10	JFET – BFW10 / BFW11	10
11	UJT – 2N2646	10
12	Step-down transformer – 230V/12-0-12V	10
13	Capacitors, assorted	10 each
14	Resistors 1/4W, assorted	10 each
15	Single-strand wires, different colours	10 each

**Faculty of Electrical Engineering**  
**B. E. INSTRUMENTATION AND CONTROL ENGINEERING**  
**(R 2021) Semester – III**

<b>Course Code: CS3362    Course Title: C PROGRAMMING AND DATA STRUCTURES LABORATORY</b>		
<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required numbers (for batch of 30 students)</b>
1.	INTEL based desktop PC with min. 8GB RAM and 500 GB HDD, 17" or higher TFT Monitor, Keyboard and mouse	30
2.	Windows 10 or higher operating system / Linux Ubuntu 20 or higher	30
3.	Standalone desktops PC	15 Nos.

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<b>Name of the Course: B. E. INSTRUMENTATION AND CONTROL ENGINEERING</b>		
<b>Course Code:EI3461</b>		
<b>Course Title: DIGITAL AND LINEAR INTEGRATED CIRCUITS LABORATORY</b>		
<b>(R 2021) Semester: IV</b>		
<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required numbers (for batch of 30 students)</b>
1.	Variable Power Supply (Dual Output), Range (0 - 30V)	6
2.	Variable Power Supply (Single Output) Range (0 - 5V)	6
3.	DSO with function generator/CRO (30MHz)	6
4.	Function generator (1MHz)	5
5.	Digital Multimeter	10
6.	Bread Board	10
7.	IC Tester (Analog & Digital)	2
8.	Variable Auto transformer (Single phase)	1
9.	Step-down transformer 230V/12-0-12V	1
10.	Personal computer	2
11.	Xilinx Software	Single User (Licensed/Open source)
12.	OrCAD Software	Single User (Licensed/Open source)
<b>Consumables (Sufficient quantity)</b>		
1.	IC 741	
2.	LM317/LM723	
3.	IC NE555	
4.	Digital IC's (7400,7402,7404,7408,7432,7486)	
5.	Digital IC - 7474 (D-FlipFlop)	
6.	Digital IC - 7476 (JK-FlipFlop)	
7.	Digital IC - 74153 (Multiplexer) & Digital IC - 74155 (Demultiplexer)	
8.	Digital IC - 74147/ 74148 (Encoder) & Digital IC - 74138 (Decoder)	
9.	Seven segment decoder IC - 7447	
10.	Seven segment display/LED	
11.	Capacitor	
12.	Potentiometer (10 k $\Omega$ )	
13.	1/4 Watt Fixed Resistor	
14.	Zener diode	
15.	4mm Banana Plug patch cords	
16.	Single Strand Wire	

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<b>Name of the Course: B. E. INSTRUMENTATION AND CONTROL ENGINEERING</b>		
<b>Course Code:EI3462</b>		
<b>Course Title: SENSORS AND SIGNAL CONDITIONING CIRCUITSLABORATORY</b>		
<b>(R 2021) Semester: IV</b>		
<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required numbers (for batch of 30 students)</b>
1	Furnace with temperature controller of range (max) 600°C	2
2	Thermocouples Type J,K,E without Thermowell	1 (each)
3	Thermocouples Type J,K,E with Thermowell	1 (each)
4	RTD,Thermistor, LVDT, Hall effect sensor,Synchro transmitter – receiver set, Gang capacitor,Load cell,Pressure cell,seismic type accelerometer	1(each)
5	LVDT, Hall effect sensor, Variable capacitor, Load cell, Pressure cell, seismic type accelerometer signal conditioner unit with analog/digital output.	1(each)
6	Strain Gage bridge with loading arrangement (Separate Quarter,Half and Full bridge units) and signal conditioner unit with analog/digital output	1
7	Standard weight 100g	15
8	Vibration exciter (shaker) (50 Hz – 1 KHz) for accelerometer	1
9	Kelvin bridge,Anderson bridge and Schering bridge unit for resistance,inductance and capacitance measurement	1(each)
10	DSO (20 MHz, 2- channel)	2
11	Signal Generator ( 1 Hz -1 MHz)	2
12	Regulated power supply (0-30)V, 2A	5
13	Dual power supply ( -15 - 0 - +15)V, 2A	3
14	Decade resistance, inductance and capacitance box	2(each)
15	Rheostat (0 - 600)ohms,1A	1
16	Voltmeter (0-300)V- MC and MI type	1(each)
17	MC Voltmeter (0-15)V	5
18	Flapper-nozzle system with pressure gage (0-30)psi	1
19	Air Compressor with storage tank capacity 50psi and pressure regulator.	1
20	Digital Multimeter	5
21	General purpose Op-amp ICs LM 741/ LM 324/ LM 358/ NE 5532 (or equivalents)	30
22	IC temperature sensors LM 35/ TMP 35, LM 335 (or equivalents)	5
23	Fixed Resistors and Capacitors of wide range	50 (each)
24	Diodes and zener diodes	10 each
25	Auto-transformer (0-270)V	1
26	Data Aquisition Cards(USB 6001 or equivalents)	6
27	Personal Computer	6
28	Bread board	5
29	Single and multi strand wires	Adequate length

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<b>Name of the Course: B. E. INSTRUMENTATION AND CONTROL ENGINEERING</b>		
<b>Course Code:EI3561</b>		
<b>Course Title: PROCESS CONTROL AND INSTRUMENTATION LABORATORY</b>		
<b>(R 2021) Semester: V</b>		
<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required numbers (for batch of 30 students)</b>
1.	Interacting and non-interacting test Rig (2 tank / 3 tank / any experimental setup that facilitates interaction among 2 process variables)	1
2.	Temperature test Rig with facility to implement ON/OFF controller	1
3.	Control valve with and without positioner fixed in any test Rig	1
4.	Process Control training plant for the control of Level and Pressure	1
5.	Flow test Rig with Industrial PID controller	1
6.	PC	5
7.	Matlab / Labview software	Minimum 5 (Licensed)
8.	i. Humidity and viscosity measurement system/kit ii. Electromagnetic flow meter mounted on a fluid pipeline	1 Each
9.	i. Speed, Torque and Vibration measurement system kit ii. Multifunction Calibrator/ any Calibrator for measurement of current, voltage and power for calibrating ammeter. voltmeter and wattmeter respectively	1 Each
10.	i. Dead weight tester and a pressure gauge for testing ii. Estimation of discharge coefficient of an Orifice plate	1 Each
11.	i. UV-Visible Spectrophotometer ii. Conductivity and pH measurement system/kit	1 Each
12.	i. Atleast two different types of flowmeters ii. Data acquisition card iii. PC iv. Flow Transmitter v. HART communicator	1 Each
13.	i. ECG and Pulse rate measurement system/ Health monitor system ii. Electrical Safety Analyser	1 Each

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<b>Name of the Course: B. E. INSTRUMENTATION AND CONTROL ENGINEERING</b>		
<b>Course Code:EI3661</b>		
<b>Course Title: INDUSTRIAL AUTOMATION SYSTEMS LABORATORY</b>		
<b>(R 2021) Semester: VI</b>		
<b>Sl. No.</b>	<b>Description of Equipment</b>	<b>Required numbers (for batch of 30 students)</b>
1.	Industrial PLCs- Siemens / Rockwell Automation / Allen Bradley / Mitsubishi Electric / Schneider Electric / Omron/Equivalent	3
2.	Programming Excercies using CODESYS 3.5 simulation software for IEC 61131-3 standards with visualizations	10 (open source)
3.	PC	10
4.	Distributed Control System (DCS)	1
5.	Pilot plant for Level Process / Flow Process / Temperature Process	2
6.	24V DC Motor with driver unit	2
7.	Filling / Draining kit with driver unit	2
8.	Alarm-Annunciator sequences kit	2
9.	Traffic Light Control kit	2
10.	Data Aquisition Card (DAQ)	2