25EE104: Departmental Workshop (EE)

W. e. f. Academic Year:	**2025-26**
Semester:	**1/2**
Category of the Course:	**Engineering Science**
Prerequisite:	Basic knowledge of Electrical Engineering
Rationale:	This syllabus is designed to provide students with a comprehensive understanding of basic electrical systems, their components, and practical applications, with a strong emphasis on safety, measurement, and energy efficiency. It integrates theoretical knowledge with hands-on experience, ensuring learners are well-equipped to handle common electrical tasks in residential and small commercial settings. It equips students with the necessary skills to carry out safe and efficient electrical installations and troubleshooting. It promotes a balance of theoretical understanding and practical ability, preparing learners for both academic advancement and real-world applications in electrical trades and engineering.

Course Outcomes:

After Completion of the Course, Student will able to:

	Course Outcome (CO)	**RBT Level (Cognitive Domain)**
CO1	Explain the structure, classification, and applications of wires and cables.	Understand
CO2	Identify and compare various safety devices such as fuses, MCB, and ELCB, and explain their working principles and differences.	Analyze
CO3	Demonstrate different types of residential wiring systems, including tube light, staircase, and godown wiring, and measure power consumption.	Apply
CO4	Use common electrical testing instruments (e.g., test lamp, megger, clip- on meter, line tester, multimeter) to troubleshoot and test electrical circuits.	Apply
CO5	Perform soldering tasks using appropriate tools and demonstrate safe handling of a soldering iron in circuit assembly.	Apply
CO6	Calculate electrical energy consumption in a residential setting, use a rheostat as a potential divider, and explain various earthing schemes and illumination devices.	Evaluate

Teaching and Evaluation Scheme:

Teaching Scheme					**Examination Scheme**				
L	**T**	**P**	**C**	**Hrs/Week**	**IE**	**Theory**	**CIA**	**Practical**	**Total Marks**
-	-	02	01	02	-	-	30	20	50

IE: Internal Evaluation Theory: Theory Exam (End Semester)
CIA: Continuous Internal Assessment Practical: Practical Exam (End Semester)

List of Practical:

Topic	Hrs
Introduction of wires & cables: -General structure & classification of cables, -Classification of wires & their use	03
To study & Identify different types of safety devices: -Fuses -MCB, ELCB. -Working & difference of MCB & ELCB	03
House wiring & tube light wiring: -To control lamps by two separate switches. -Using tubelight wiring measure the power consumption in it.	03
Staircase wiring & Godown wiring: -To control one lamp by two switches in staircase wiring -To control two or more switches in godown wiring.	03
To study & use of common testing instruments: - Test lamp - Megger - Clip-on meter - Line tester - Multimeter	03
To study about how to use soldering iron Use of different tools in soldering any circuit.	03
To calculate electric energy usage at residential area.	03
To use rheostat as a potential divider.	03
To study various types of Earthing schemes.	03
To study different types of illumination devices & their application.	03
	30

Reference Books:

1. B.L. Theraja (2012), Electrical Technology, Vol – 1, S. Chand Publication.
2. U.A.Patel (2012), Elements of Electrical Engineering, Atul Publication.
3. Introduction to Electrical Engineering by Mulukutla S. Sarma, Oxford University Press.
4. V. N. Mittal and A. Mittal (2012), Basic Electrical Engineering, Tata McGraw Hill, Publication.
5. D.P. Kothari and I.J. Nagrath (2013), Theory and Problems in Basic Electrical Engineering, Prentice Hall, India.
6. J.N.Swamy, N.V.Sinha, Elements of Electrical Engineering, Mahajan Publishing House.
7. S.R. Vyas, S.G. Prajapati, R.P. Sukhadia, M. Rathod, Basic Electrical and Electronics Engineering, Synergy Knowledgeware.

Course Outcomes Mapping:

CO No.	Course Outcome (CO)	POs/ PSOs Mapped	Cognitive Level (RBT)	Knowledge Category	Lab (Hrs)
CO1	Explain the structure, classification, and applications of wires and cables.	PO1, PO2, PSO1	Understand	Conceptual	4
CO2	Identify and compare various safety devices such as fuses, MCBs, and ELCBs, and explain their working principles and differences.	PO1, PO2, PO6, PSO1	Analyze	Conceptual Procedural	4
CO3	Demonstrate different types of residential wiring systems, including tube light, staircase, and godown wiring, and measure power consumption.	PO1, PO3, PO5, PSO1, PSO2	Apply	Procedural	6
CO4	Use common electrical testing instruments (e.g., test lamp, megger, clip-on meter, line tester, multimeter) to troubleshoot and test electrical circuits.	PO4, PO5, PSO1,	Apply	Procedural	6
CO5	Perform soldering tasks using appropriate tools and demonstrate safe handling of a soldering iron in circuit assembly.	PO5, PO9, PSO2	Apply	Procedural	6
CO6	Calculate electrical energy consumption in a residential setting, use a rheostat as a potential divider, and explain various earthing schemes and illumination devices.	PO1, PO7, PO12, PSO1, PSO2	Evaluate	Conceptual Procedural	4

Mapping of COs with POs & PSOs:

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	0	0	0	0	0	0	0	0	0	0	3	0
CO2	3	2	0	0	0	1	0	0	0	0	0	0	3	0
CO3	3	0	1	0	3	0	0	0	0	0	0	0	3	3
CO4	0	0	0	1	3	0	0	0	0	0	0	0	3	0
CO5	0	0	0	0	3	0	0	0	1	0	0	0	0	3
CO6	3	0	0	0	0	0	1	0	0	0	0	1	3	3

3: High, 2: Medium, 1: Low