

SKILL ENHANCEMENT COURSE (SEC) IN ELECTRICAL WIRING AND SERVICING

DETAILED SYLLABUS

Course Code: SEC243

Course Title: Electrical Wiring and Servicing

Nature of the Course: SEC

Total credits assigned: 03

End Sem. 80(40T+40P) Marks; In Sem: 20 Marks

Course Objectives: At the completion of this course, a student will be able to

1. Understanding of the basics of power electronics and its usages in electronic circuit controls.
2. To identify and understand the problem in the various type of household electronic circuits.
3. Identify dysfunctional components through visual inspection and by use of multi-meter.
4. To understand, various electronic & electrical components, materials and their specific properties & usages.
5. Hands on activities of Electrical wiring
6. Special safety and handling precautions to be taken during electronic circuits testing and servicing.
7. Assemble Various parts of electronic circuits.
8. 5S standards (sorting, setting, standardize, sustain, shining) + safety, security.

UNITS	CONTENTS	L	T	P
1	<p>Basic Electronics: -</p> <p>1.1 Understanding the electrical properties of Resistor, Capacitor</p> <p>1.2 PN junction diode, Zener and Light emitting diode, Transistor (BJT,FET)</p> <p>1.3 Inductor, IC, Transformer. Understand</p> <p>1.4 Understand the functionality of Multimeter, Power meter, AC to DC regulated power supply, Ammeter, Voltmeter.</p> <p>LABORATORY (2 hours per week)</p> <p>1. To know & identify the electrical circuit components.</p> <p>2. To use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) AC and DC Current, and (d) checking electrical fuses.</p> <p>3. Making of regulated power supply.</p>	8	4	4
2	<p>Electrical Wiring: -</p> <p>2.1 Different types of conductors and cables</p> <p>2.2 Basics of Electrical Wiring-Star and delta connection</p>	8	4	4

	<p>2.3 Voltage drops and losses across cables and conductors 2.4 Insulation of circuits. Solid and stranded cable. 2.5 Electrical Protections: Relays, fuses and disconnect switches, Circuit breakers, Overload devices. Ground-fault protection. Grounding and isolating.</p> <p>LABORATORY(2 hours per week)</p> <ol style="list-style-type: none"> 1. Understanding the electrical properties of - IC, Diode, Resistor, Capacitor, Transistor (BJT, FET), Inductor and Transformer. 2. Assemble various parts of electronic circuits and Fabrication of Electrical extension board. 3. Handling of Instruments to measure power in DC and AC circuits. 			
3	<p>Generators and Digital Instruments: -</p> <ol style="list-style-type: none"> 3.1 DC Power sources. AC/DC generators. Operation of transformers 3.2 Electric Motors: Single-phase, three-phase alternating current sources & DC motors. 3.3 Interfacing DC or AC sources to control heater and motors, speed and power of ac motor. Principle and working of digital meters 3.4 Comparison of analog & digital instruments Characteristics of a digital meter. Working principles of digital voltmeter. <p>LABORATORY (2 hours per week)</p> <p>Measurement &Service: -</p> <ol style="list-style-type: none"> 1. Soldering of components and selecting proper temperature for soldering of components while using a temperature controlling solder iron. 2. Explaining the working principle of electronic circuits. 3. Explaining various blocks of an electronic circuits. 4. Analyzing the fault by approaching each block. 5. Ensure the fault before demounting any element from the circuit. 6. Continuing the test process until every test process is checked properly. 7. Ensure that the repaired system is ok before sending it to mechanical assembling 	8	4	4
	Total	24	12	12

L: Lecture

T: Tutorial

P: Practical

Mode of Assessment in End of course: Theory: 40 Marks

Laboratory:40 Marks

Expected Learning outcome: This course will

1. Develop the basic practical knowledge and skills of the students on electrical circuit testing, repairing including household electrical and electronics appliances.
2. Train the students to handle and repair instruments based on electric and magnetic field effects.
3. Identify and understand digital electronic principles and systems.
4. Apply the knowledge to analyze and apply digital circuits in solving circuit level problems.

Recommended readings

1. Principle of Electronics; V.K. Mehta
2. Electricity and Magnetism; [R Murugesan](#)
3. Electrical Engineering and Electronics; [B.L. Theraja](#)
4. A B C of Electrical Engineering; A.K. Theraja