

Certificate Course

Course Title: Basic Instrumentation Design

Course Objectives:

1. To introduce fundamental concepts of electricity, including electric charge, voltage, current, Ohm's law, and circuit components.
2. To provide an understanding of different types of batteries, their construction, and maintenance, focusing on lead-acid batteries.
3. To familiarize students with basic electronic and electrical components, both active and passive, and their applications in circuits.
4. To teach troubleshooting techniques, including identifying and resolving issues in electrical circuits and components.
5. To develop skills in testing and replacing faulty components in electrical and electronic systems using proper troubleshooting methods.
6. To educate students on the safety procedures and precautions needed when working with electrical systems, including the use of protective equipment.
7. To provide knowledge on reporting incidents such as system failures and power issues, along with administering first aid in case of electrical accidents.

Course Outcomes (CO):

CO1: Demonstrate a strong understanding of basic electrical concepts such as voltage, current, and Ohm's law, and their applications in circuits.

CO2: Identify and differentiate between various types of batteries, including their construction and characteristics, with a focus on lead-acid batteries.

CO3: Recognize and explain the function of both active and passive electronic components and their role in different types of circuits.

CO4: Apply systematic troubleshooting methods to diagnose and resolve issues in electrical circuits and components.

CO5: Perform testing, removal, and replacement of faulty components in circuits, following logical steps for fault finding.

CO6: Implement proper safety and security procedures when working with electrical equipment, including the use of protection and first aid measures.



CO7: Report system and power failures effectively and follow procedures to mitigate risks during electrical incidents.

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Module 1

Introduction to Electricity Electric Charge, Voltage, Electric Current Ohm's Law, Electric Potential, Cell Serial and Parallel Circuit, their effect on Voltage and Current Transformer, Use and Operation Electronic and Electrical components Active and Passive Components

Module 2

Battery types, Primary Cell, Secondary Cell, Wet- charged, Dry-charged, Low maintenance Construction of Battery, Case Cover plates, Separator, Cells, Electrolyte, etc Lead Acid battery, Power supply maintenance.

Module 3

Troubleshooting techniques Basic troubleshooting method, Getting into troubleshooting, selected instruments for troubleshooting Component testing methods, Testing of components in circuits, Logical steps of fault finding, Troubleshooting through circuit diagram Removal and Replacement of faulty component

Module 4

Safety and Security Procedures Reporting incidents, system failures, power failures etc., protection equipment First aid requirement in case of electrical shocks and other injuries.



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