



GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Diploma in Vocation (D.Voc), 3rd Semester

Branch: Electrical Wiring

Subject Name: Electrical Hazard Management

Subject Code: 1230802

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	P	OJT		Theory		Tutorial/ Practical		
			University exams (ESE)	Progressive Assessment (PA)	External Practical /viva Exam(ESE)	Internal evaluation Practical /viva Exam(PA)		
3	0	0	3	50	0	0	0	50

L- Lectures; P- Practical; OJT- On Job Training; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Program Objectives:

- To make the students aware about various electrical principles to safety.
- Identifying and assessing electrical risks
- Ensuring public and workplace safety through legislative compliance.
- Responsibility toward safety protocols and legal standards.

Course Content: Theory

Unit No.	Content	No. of Hours
1.	<p>Fundamentals of Electricity and Electrical Hazards Basic concepts of electricity: voltage, current, resistance, power AC and DC systems – basic differences Electrical energy and power calculation Definition of electrical hazard Types of electrical hazards: Electric shock Burns (electrical and thermal) Arc flash and arc blast Electrical fires and explosions Physiological effects of electric current on human body Factors affecting severity of electric shock Common causes of electrical accidents in domestic and industrial environments Importance of electrical hazard management</p>	7
2	<p>Electrical Safety Rules, Standards, and Legislation Need for electrical safety standards Indian Electricity Act – basic provisions related to safety Factory Act – electrical safety clauses Overview of IS (Indian Standards) and IEC safety standards Electrical safety rules for low, medium, and high voltage systems Roles and responsibilities of: Employer, Supervisor, Electrical worker Safety signs, symbols, Color codes, and warning notices Permit-to-work system, Importance of compliance and legal consequences of violations</p>	10



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3	Identification of Electrical Hazards and Risk Assessment Identification of electrical hazards at: Homes, Workshops, Construction sites, Industries Unsafe acts and unsafe conditions related to electrical work Electrical wiring defects and insulation failures Overloading and short-circuit hazards Electrical fire hazards – causes and prevention Risk assessment concepts: Hazard identification, Risk evaluation, Risk control measures Introduction to Job Safety Analysis (JSA) Importance of earthing and grounding Types of earthing systems	7
4	Electrical Hazard Control Measures and Protective Systems Hierarchy of hazard control: Elimination, Substitution, Engineering controls, Administrative controls, Personal Protective Equipment (PPE): Insulated gloves Safety shoes Helmets Face shields Safe handling of electrical tools and equipment, Isolation techniques and safe switching procedures, Lockout and Tagout (LOTO) system Protective devices: Fuse MCB MCCB ELCB / RCCB Importance of regular maintenance and inspection Safe practices during installation, testing, and maintenance	8
5	Emergency Management, First Aid, and Accident Reporting Electrical emergency situations and response procedures, Rescue techniques for electric shock victims, First aid for electric shock and electrical burns, CPR basics and life-saving technique Electrical fire fighting: Types of fire extinguishers Use of CO ₂ and dry powder extinguishers Evacuation procedures during electrical accidents Accident reporting and investigation, Documentation and safety records, Preventive measures and safety awareness programs	10
Total		42



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Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
10	20	15	5	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate and above Levels (Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. A Textbook of Electrical Technology (Vol. I & II) S. Chand & Company – B. L. Theraja & A. K. Theraja
2. Safety Engineering and Management Pearson Education - Subramaniam, S.
3. Industrial Safety and Disaster Management Laxmi Publications - R. K. Rajput

(b) Open source software and website:

1. <https://nptel.ac.in/>

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Understand electrical hazards and their effects.
02	Apply electrical safety rules and standards.
03	Identify and assess electrical risks.
04	Use protective devices and safety equipment effectively.
05	Respond safely to electrical emergencies and accidents.