GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc), 5th Semester
Branch: Solar and Renewable Energy
Subject Name: Junior Engineer - Power Distribution
Subject Code: 1150707

Type of course: Under Graduate

Prerequisite: None

Rationale: Understanding of basic Power system, Erection and installation of power distribution system

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
0	0	15	15	0	0	100	100	200

Content:

Sr. No.	Topic	No. of hours	% Weightage
1.	**Understand Power system block diagram** Basic block diagram of power system. Discuss different sector in power system. Discuss Power industry and Distribution subsector.	10	05
2.	**Basic Concepts of electricity** Discuss the basic laws of electricity such as Ohms law, Kirchhoff's Voltage Law (KVL) and Kirchhoff's Current Law (KCL) in electrical installations. List various symbols used in electrical components.	20	10
3.	**Understand the basics of electricity and Power system concepts.** State the electrical units used to measure energy outputs like KVA, KWH, etc Explain the basic concepts of AC single phase and three-phase supply and current and voltage transmission. Discuss the relevance of power factor. Discuss the basic laws and principles of Electricity in relation to energy meters. Perform simple calculations to derive power and energy,	30	15
4.	**Components of power distribution system** Describe the structure of power distribution substation and various distribution substation equipment such as circuit breakers, switchgears, isolators, CT's, PT's and CVT's, capacitor bank etc. Discuss the operating principle, technical parameters and specifications of various components, equipment, measuring instruments and accessories installed at substation	30	15
5.	**Erection and installation of power distribution system** List the tools and equipment required during erection and commissioning work of substation equipment.	20	10

	Explain how to read network schematics, line diagrams and technical drawings for identification of components, equipment, measuring instruments, accessories, etc. to install at distribution system.		
6.	**Inspection and maintenance of power distribution system:** List tools, tackles and safety gadgets required during inspection and maintenance activities in power distribution substation.	20	10
7.	**Power System distribution system:** Describe methods of inspecting the faults, wear and tear in equipment, components, conduit, wiring or cable etc. installed at the substation. Discuss the importance of monitoring Remote Terminal Unit (RTU), Ring Main Unit (RMU) and Other Automation System.	40	20
8.	**Material Conservation:** Explain the importance of optimizing the use of materials at the workplace. Describe practices of efficient and inefficient management and utilization of material and water at the workplace.	10	5
9.	**Workplace health and safety practices** State the importance of working in clean and safe environment. Identify potential health and safety risks and hazards in the work environment and their possible causes. Identify various causes of fire, such as heating of metal, spontaneous ignition, sparking, electrical heating, loose fires, smoking, welding, chemical fires, etc. Describe the different methods of extinguishing a fire	20	10

Course Outcomes:

Sr No.	CO statement	Marks % weightage
CO1	To Understand basic concept of Power system	30
CO2	To Understand use of Protective Equipment and material in power system	20
CO3	Erection and maintenance of power distribution system	20
CO4	To Understand health and safety practices on work place	20

Reference:

1. Principles of Power System: V. K. Mehta, Rohit Mehta, S. Chand Publications
2. Elements of Power Systems Analysis: W. D. Stevenson Jr., McGraw Hill Education.
3. https://nsdcindia.org/nos-listing/30