GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for Bachelor of Vocation (B.Voc.), 4th Semester
Branch: Solar & Renewable Energy
Subject Name: Energy Conservation and Management
Subject Code: 1140704

Type of course: Core

Prerequisite: Fundamental knowledge of Energy and Electrical System

Rationale: Electricity is widely used worldwide, especially in industries. Saving energy is crucial, especially in developing countries where costs are high. Using energy wisely helps reduce pressure on energy sources and costs. It's important to teach people how to save energy, especially in industries. Energy audits can identify ways to save energy. This course teaches techniques for energy conservation in engineering and how to conduct energy audits.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical		
L	T	P	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
03	0	0	03	50	0	0	0	50

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End SemesterExamination; PA- Progressive Assessment

Content:

Sr. No.	Content	Total Hrs.	Module % Weightage
1	**Essentials of Energy Conservation:** Indian energy scenario and sector-wise energy consumption, Need of energy conservation, Principle of Energy conservation, Benefits of energy conservation, Environment and Economic aspect for energy conservation.	04	10
2	**Energy Conservation Policies and Acts:** Overview of the Energy Conservation Act, National Electricity Policy and Plan, Renewable energy policies and initiatives, Power sector reforms and restructuring, Energy strategy for the future	08	15
3	**Savings through Efficient Electrical Systems:** Energy efficient induction motor and its advantages, Benefits of power factor improvement and it's improvement techniques, automatic power factor controllers, Energy conservation by variable speed drive, Need of Energy efficient transformer, Comparison between Conventional Transformer and Energy Efficient Transformers	12	35
4	**Saving Energy in Power Generation, Transmission and Distribution:** Co-generation and its need, Types and advantages of co-generation, Measures to reduce transmission line losses, Efficient Energy Use Through Demand Side Management, Tariff Restructuring for Efficiency	10	25
5	**Energy Saving System Analysis:** Cost Variations in Energy Conservation Projects, Depreciation Calculation Methods, Economic Analysis Approaches.	08	15
	Total	**42**	**100**

Reference Books:

1. O.P. Gupta, “Energy Technology”, Khanna Publishers, New Delhi.
2. Dr. Sanjeev Singh, “Energy management”, S K Kataria & Sons, New Delhi.
3. Sharma, K. V., Venkataseshaiah," Energy Management and Conservation " I K International Publishing House Pvt. Ltd.
4. S. Sivaganaraju, “Electric Energy Generation, Utilisation and Conservation”, Pearson, New Delhi, 2012

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	10	15	15	--	--

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

Course Outcomes:

Sr. No.	CO Statement	Marks % Weightage
CO-1	Understanding the Importance of Energy Conservation	25%
CO-2	Applying Energy Conservation Methods in Electrical System	35%
CO-3	Enhancing Electrical Power System Efficiency Through Energy Conservation Measures.	25%
CO-4	Assessing the Techno-Economic Feasibility of Energy Conservation Projects	15%

List of Open Source Software/learning website:
https://nptel.ac.in.