



## **C.U.SHAH UNIVERSITY – Wadhwan City**

**FACULTY OF:** -Technology and Engineering (Diploma Engineering)

**DEPARTMENT OF:** -Electrical Engineering

**SEMESTER:** - III

**CODE:** - 2TE03GEP1

**NAME** – Generation of Electrical Power (GEP)

### **Teaching & Evaluation Scheme:-**

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evolution Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total Marks
							Sessional Exam		University Exam		Internal		University	
							Marks	Hours	Marks	Hours	Pr	TW	Pr	
2TE03GEP1	Generation of Electrical Power (GEP)	3	0	2	5	4	30	1.5	70	3	30	20	-----	150

### **Objectives:-**

- To Developed the Basic Knowledge of Principles & Concept of Electrical Power Generation
- Energy Conversion Process for Every Electrical Power Plant
- Understanding Working Principle of Power Generation Using Alternate Sources of Energy
- Solve Problem Related to Economy of Power Generation & How to Improve it.

**Prerequisites:** - Basic Knowledge of Different Form of Energy & Fundamental of Electrical Energy Generation

### **Course Outlines:-**

Sr. No.	Course Contents	No Of Hours
1	<b>Thermal Power Station:-</b> Universal Law of Energy Conservation, Energy Conversion Process for Thermal Power Station With Plant Layout, Selection Criteria for Site of Thermal Power Station, Line Diagram of Thermal Power Station, Different Cycles of Thermal Power Station with Equipment and Auxiliaries of TPS, Pollution Generated by TPS, Major TPS in Gujarat	8
2	<b>Hydro Power Station:-</b> Energy Conversion Process for Hydro-Power Station (HPS) , Selection of Site for HPS Site, Classification of HPS: Based on Head, Types of Hydro Turbines; Auxiliaries ,Safe Practices of HPS , Advantages of Hydro Power Plants and Their Effect on Ecology/Environment, Hydro Power Stations in Gujarat	5
3	<b>Nuclear Power Station:-</b> Energy Conversion Process for NPS: Nuclear Fusion and Fission, Chain Reaction , Selection of Site for NPS, Working of Nuclear Power Station , Various types of Reactors ,Special Precautions for NPS, Advantages and Disadvantage of NPS ,Nuclear Power Stations in Gujarat	4
4	<b>Non-Conventional Methods Of Power Generation:-</b> Introduction, MHD Power Generation, Solar Power Generation, Wind Power Generation, Tidal Power Generation, Geothermal Power Generation, Ocean Energy Thermal Conversion (OTEC), Electrical Energy Conversion of Biomass energy, DG Sets & Gas-Based Power Plants. Advantages and Disadvantage	9

5	<b>Economics Of Power Generation:-</b> Load on Power Stations, Load Curves-Important Terms and Factors, Load Duration Curves -Types of Loads, Typical Demand and Diversity Factors, Significance of Load Factor and Diversity Factor, Load Sharing Between Base Load & Pick Load Plants, Economics of Power Generation, Choice of Size and Number of Generating Units, Cost of Electrical Energy, Expressions for Cost of Electrical Energy, Methods of Determining Depreciation, Importance of High Load Factor	11
6	<b>Power Factor Improvement:-</b> Power Factor, Power Triangle, Disadvantages of Low Factor, Causes of Low Power Factor, Power Factor Improvement-Equipments, Calculations of Power Factor Correction, Importance of Power Factor Improvement, Most Economical Power Factor	7
7	<b>Tariff:-</b> Tariff, Objectives of Tariff, Desirable Characteristics of Tariff, Types of Tariff in Brief	4

### List of Experiments:-

- Visit to a Nearby T.P.S./Prepare a Report on Thermal Power Stations in Gujarat by Collecting Data From Internet
- Visit to a Nearby H.P.S./Prepare a Report on Hydro Power Stations in Gujarat by Collecting Data From Internet
- Interpret The Schematic Diagram of Nuclear Power Station & Explain the Function of Each Component.
- Interpret The Schematic Diagram of a Diesel Power Station & Explain The Function Of Each Component.
- Study Electrical Energy Conversion of DG Sets
- Draw and Interpret Schematic Diagram Biogas Plant
- Collect the Data From Nearest Power Station for Load Curve Preparation and Interpret it.
- Prepare Technical Report of Visit to a Nearby Wind Farm
- Prepare Technical Report of Visit to A Nearby Solar PV Station.
- Improve the Power Factor – Case Study
- Given an Energy Bill (Industrial / Commercial) Interpret in View of Current Norms
- Tariff – Case Study

### Learning Outcomes:-

- Application & Importance of Electrical Power Plants.
- Definition & Identification Related to Economics of Power Generation
- Knowledge about Calculations of Power Factor Correction.
- Knowledge about Power Generation Using Non-Conventional Energy Sources.
- Importance of Economic Power Generation

### Books Recommended:-

- Generation and Economic Considerations. **By J.B. Gupta**
- Electrical Power System- **V.K.Mehta**, S. Chand & Co., New Delhi, 2011
- Wind Power Technology , **Earnest, Joshua**, PHI Learning, New Delhi, 2013
- Electrical Power, **S.L .Uppal** , Khanna Publication, New Delhi, 2011
- Power Plant Engineering, **P K Nag** , Tata Mcgraw Hill, New Delhi, 2011
- Renewable Energy Technologies, **Chetan S Solanki** , PHI Learning, New Delhi, 2011
- Principal Of Power System , **V.K.Mehta** , S.Chand