

No	Course Information	
1	Unit name:	Generation, Transmission and Distribution
2	Code:	EP 21026
3	Classification:	Engineering subject
4	Credit value:	2.5
5	Semester/ Year Offered:	1/2
6	Pre-requisite:	NA
7	Mode of delivery:	Lecture, Tutorial
8	Assessment system and breakdown of marks:	
	Test	20%
	Mid-term Examination	30%
9	Academic staff teaching unit:	Department of Electrical Power Engineering
10	<p>Course outcome of unit:</p> <p>In this course students will be able</p> <ul style="list-style-type: none"> • To explain the concepts of various method for electrical energy generation, sources of energy and units of energy • To explain the various generating stations, schematic arrangement of various power plants and constituents of power plants • To describe the variable load, types of load, load curve and load duration curve on power stations • To describe the various methods of annual depreciation charge, the cost of electrical energy, the types of tariff, the importance of power factor improvement and the power factor correction 	
11	<p>Synopsis of unit:</p> <p>The course covers the fundamental of power system. Topics covered to provide a comprehensive treatment of topics in ‘‘Power System’’ for electrical students. Firstly, the course introduces students to understand the importance of electrical energy. Then, the course explains about the generation, transmission and distribution system. Moreover, The course describes the variable load on power station, economics of power generation, tariff and power factor improvement.</p>	

Chapter Title**1. Introduction**

- ❖ 1.1 Importance of Electrical Energy
- ❖ 1.2 Generation of Electrical Energy
- ❖ 1.3 Sources of Energy
- ❖ 1.4 Comparison of Energy Sources
- ❖ 1.5 Units of Energy
- ❖ 1.6 Relationship Among Energy Units
- ❖ 1.7 Efficiency
- ❖ 1.8 Calorific Value of Fuels
- ❖ 1.9 Advantages of Liquid Fuels Over Solid Fuels
- ❖ 1.10 Advantages of Solid Fuels Over Liquid Fuels

2. Generating Stations

- ❖ 2.1 Generating Stations
- ❖ 2.2 Steam Power Station (Thermal Station)
- ❖ 2.3 Schematic Arrangement of Steam Power Station
- ❖ 2.4 Choice of Site for Steam Power Stations
- ❖ 2.5 Efficiency of Steam Power Station
- ❖ 2.6 Equipment of Steam Power Station
- ❖ 2.7 Hydro-electric Power Station
- ❖ 2.8 Schematic Arrangement of Hydroelectric Power Station
- ❖ 2.9 Choice of Site for Hydro-electric Power Stations
- ❖ 2.10 Constituents of Hydro-electric Plant
- ❖ 2.11 Diesel Power Station
- ❖ 2.12 Schematic Arrangement of Diesel Power Station
- ❖ 2.13 Nuclear Power Station
- ❖ 2.14 Schematic Arrangement of Nuclear Power Station
- ❖ 2.15 Selection of Site for Nuclear Power Station
- ❖ 2.16 Gas Turbine Power Plant
- ❖ 2.17 Schematic Arrangement of Gas Turbine Power Plant
- ❖ 2.18 Comparison of the Various Power Plants

3. Variable Load on Power Stations

- ❖ 3.1 Structure of Electric Power System
- ❖ 3.2 Variable Load on Power Station
- ❖ 3.3 Load Curves
- ❖ 3.4 Important Terms and Factors
- ❖ 3.5 Units Generated per Annum
- ❖ 3.6 Load Duration Curve
- ❖ 3.7 Types of Loads
- ❖ 3.8 Typical Demand and Diversity Factors
- ❖ 3.9 Load Curves and Selection of Generating Units
- ❖ 3.10 Important Points in the Selection of Units
- ❖ 3.11 Base Load and Peak Load on Power Station
- ❖ 3.12 Method of Meeting the Load
- ❖ 3.13 Interconnected Grid System

4. Economics of Power Generation

- ❖ 4.1 Economics of Power Generation
- ❖ 4.2 Cost of Electrical Energy
- ❖ 4.3 Expressions for Cost of Electrical Energy
- ❖ 4.4 Methods of Determining Depreciation
- ❖ 4.5 Importance of High Load Factor

5. Tariff

- ❖ 5.1 Tariff
- ❖ 5.2 Desirable Characteristics of a Tariff
- ❖ 5.3 Types of Tariff

6. Power Factor Improvement

- ❖ 6.1 Power Factor
- ❖ 6.2 Power Triangle
- ❖ 6.3 Disadvantages of Low Power Factor
- ❖ 6.4 Causes of Low Power Factor
- ❖ 6.5 Power Factor Improvement
- ❖ 6.6 Power Factor Improvement Equipment
- ❖ 6.7 Calculations of Power Factor Correction

	<ul style="list-style-type: none"> ❖ 6.8 Importance of Power Factor Improvement ❖ 6.9 Most Economical Power Factor ❖ 6.10 Meeting the Increased kW Demand on Power Stations
14	<p>Main references:</p> <p>V.K MEHTA ROHIT MEHTA: Principles of Power System (4th Revised Edition)</p>
15	<p>Additional references:</p> <ol style="list-style-type: none"> 1. Energy and Power Generation Handbook (Established and Emerging Technologies, Editor K. R. Rao) 2. Power Technologies Energy Data Book April 2005 • NREL/TP-620-37930 Third Edition 3. Power Plant Electrical Distribution Systems Gary W Castleberry, PE