GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 4

Electrical Engineering

Subject Code 140902
Subject Name Electrical Power

Sr.No	Course content
1.	Steam power station: Schematic arrangement, advantages and disadvantages, choice of site, efficiency of steam power station, Types of prime movers, characteristic, speed control & auxiliaries. Environmental aspects for selecting sites and locations of thermal power stations.
2.	Hydro power station: Schematic arrangement, advantages and disadvantages, choice of site constituents of hydro power plant, Hydro turbine. Environmental aspects for selecting sites and locations of hydro power stations
3.	Nuclear power station: Schematic arrangement, advantages and disadvantages, selection of site, types of reactors, Hazards Environmental aspects for selecting sites and locations of nuclear power stations.
4.	Gas turbine power plant: Schematic arrangement, advantages and disadvantages.
5.	Combined cycle power plant: Combined cycle power plant,Comparison of various power plants
6.	Power Generation by Non Conventional Energy Sources: Solar – Merits and limitations of solar energy conversion and utilization, solar pond and binary cycle solar thermal power plant Wind – Applications, Merits and demerits of wind energy, types of wind energy system, wind turbine generator unit with battery storage facilities
7.	Distribution: Overhead & underground transmission of power, Types of distribution systems, types of cables & their construction, Types of conductors. Types of insulators, string efficiency
8.	Transmission line parameters: Inductance of 1-phase, two-wire line and composite conductor lines, inductance of 3-phase line with symmetrical and unsymmetrical spacing with and without transposition, double circuit line, bundled conductors, resistance and skin effect and proximity effect, , capacitance of 1-phase and 3-phase transmission line, effect of earth on transmission line capacitance performance, Ferranti effect.

9.	Substation: Classification of Substations, substation equipments.
10.	Power Factor Improvement: Consideration of effect of low power factor, Advantages of power factor improvement, methods of improving power factor, the most economical power factor
11.	Neutral Earthing: Introduction, isolated neutral, earth neutral systems-solid, resistance, reactance. Arc suppression coil, voltage transformer and earthing transformer, earthing systems.

Reference Books:

1. Electrical Power Transmission and Distribution, by Sivanagaraju & Satyanarayana, Pearson Edu.
2. Power System Analysis and Design – Glover, Sarma , Overbye. Cengage Publication
3. Energy Technology by S. Rao & Dr. B.B.Parulekar
4. Renewable energy sources and conversion technology by N.K. Bansal
5. Renewable Energy Sources – G. D. Rai
6. Power System Generation– B.A. Oza
7. Electrical Power Stations– M.V. Deshpande, PHI Publications
8. Electrical Power — Dr. S.L. Uppal,
9. A course in electrical power — Soni, Gupta and Bhatnagar