

# GUJARAT TECHNOLOGICAL UNIVERSITY

## PDDC Electrical Engineering

### Semester: III

Subject Name: **Electrical Power**

Sr.No	Course content
1.	<b>Steam power station:</b> 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.	<b>Hydro power station:</b> 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.	<b>Nuclear power station:</b> Schematic arrangement, advantages and disadvantages, selection of site, types of reactors, Hazards Environmental aspects for selecting sites and locations of nuclear power stations.
4.	<b>Gas turbine power plant:</b> Schematic arrangement, advantages and disadvantages.
5.	<b>Combined cycle power plant:</b> Combined cycle power plant, Comparison of various power plants
6.	<b>Power Generation by Non Conventional Energy Sources:</b> <b>Solar:</b> Merits and limitations of solar energy conversion and utilization, solar pond and binary cycle solar thermal power plant <b>Wind:</b> Applications, Merits and demerits of wind energy, types of wind energy system, wind turbine generator unit with battery storage facilities
7.	<b>Distribution:</b> Overhead & underground transmission of power, Types of distribution systems, types of cables & their construction, Types of conductors. Types of insulators, string efficiency
8.	<b>Transmission line parameters:</b> 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.	<b>Substation:</b> Classification of Substations, substation equipments.
10.	<b>Power Factor Improvement:</b> Consideration of effect of low power factor, Advantages of power factor improvement, methods of improving power factor, the most economical power factor
11.	<b>Neutral Earthing:</b> 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