

# GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 3

## Power Electronics Engineering

Subject Code 132401

Subject Name Basic Power Systems Engineering

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Sr.No	Course content
1	Introduction: Block diagram of different power system like hydro, thermal, nuclear power station. Different components of transmission and distribution system like transformer, breaker, isolator, fuses.
2	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, capacitance of 1-phase and 3-phase transmission line, Ferranti effect.
3	Performance of Transmission lines: Representation of power systems components, One line diagram and impedance/reactance diagram, per unit system representation, Power circle diagram, receiving end and sending end power circle diagram, universal circle diagram. Consideration of effect of low power factor, Advantages of power factor improvement,- methods of improving power factor, the most economical power factor.
4	HVDC Transmission: Principle, Operation and control of HVDC, Economics, Basic equipments, operation of converters, parallel operation of AC DC system.
5	Neutral Grounding: Introduction, isolated neutral, earth neutral systems-solid, resistance, reactance. Arc suppression coil, voltage transformer and earthing transformer, earthing systems.
6	Symmetrical Components

### Reference Books:

1. Modern power system analysis — Nagrath & Kothari
2. A course in electrical power — Soni, Gupta and Bhagtnagar.
3. HVDC – K. R. Padhiyar
4. Electrical Power Utilization – J. B. Gupta.
5. Electrical power — Dr. S.L. Upal