GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 4

Electrical Engineering

Subject Name Energy Systems (Institute Elective – I)

Sr. No.	Course content
1.	Generating Stations : Steam Power station-Schematic Arrangement of steam power station-Choice of Site for steam Power stations-Efficiency of Steam Power station.- Equipment of Steam Power Station-Hydroelectric Power Station-Schematic Arrangement of Hydroelectric Power Station- Choice of Site for Hydroelectric Power Stations-Constituents of Hydroelectric Plant-Diesel Power Station- Schematic Arrangement of Diesel Power Station-Nuclear Power Station- Schematic Arrangement of Nuclear Power Station-Selection of Site for Nuclear Power Station-Gas Turbine Power Plant- Schematic Arrangement of Gas Turbine Power Plant-comparison of the Various Power Plants.
2.	Wind Energy System: Grid connected systems, system configuration, working principles, limitations, effects of wind speed on grid conditions, grid independent systems - wind-battery, wind-diesel, wind-hydro-biomass etc., wind operated pumps, controller for energy balance
3.	Solar Energy: Solar radiation, terrestrial solar radiation, radiation balance, generalized transmission scattering by atmosphere, absorption of solar radiation, direct solar radiation. Low temperature solar radiation collector, flat plate collectors, optical characteristics of the absorber and the cover, HWB collector model, low temperature applications of solar energy solar swimming systems, solar drying, basic drying parameters, design calculation of solar drier, solar heat pump, solar refrigeration and air conditioning, electricity by solar, solar panels for battery charging. Solar Phototonic System: Characteristics, applications to lighting and water Pumps, PV panels, characteristics of motors and pumps connected to PV set.
4.	Other Energy Technology: Fuel cell technology: electromechanical effects and fuel cells, Reversible cells, Ideal Fuel cells, other types of fuel cells, Efficiency of fuel cells. Hydrogen Energy Technology Ocean Energy: Power plant based on Ocean energy. Bio fuel technology.

REFERENCE BOOKS:

1. Renewable energy sources and conservation technology
2. Principles of Electrical Power System, by V.K.Mehta, S.Chand Pub
   By- N.K. Bansal, Kleemann and Meliss published by
   Tata McGrawHill Publ.Co. Ltd., New Delhi
3. G. D. Rai – Non Conventional Energy Sources, Khanna Publishers
4. Power Plant Engineering By A K Raja, A P Shrivastava, manish dwivedi. New Age International Publishers