

Date: 3/09/2014

**PARUL INSTITUTE OF ENGINEERING AND TECHNOLOGY
MECHANICAL ENGINEERING DEPARTMENT
SYLLABUS FOR MID TERM EXAM (7TH SEM-2014)**

SUBJECT: Energy Conservation and Management (171907)

1. Energy Scenario:

Commercial and Non-commercial energy, primary energy resources, commercial energy production, final energy consumption, Indian energy scenario, Sectoral energy consumption (domestic, industrial and other sectors), energy needs of growing economy, energy intensity, long term energy scenario, energy pricing, Energy security, energy conservation and its importance, energy strategy for the future, Energy Conservation Act 2001 and its features.

2. Basics of Energy its various forms and conservation:

Electricity basics – Direct Current and Alternative Currents, electricity tariff, Thermal Basics-fuels, thermal energy contents of fuel, temperature and pressure, heat capacity, sensible and latent heat, evaporation, condensation, steam, moist air and humidity and heat transfer. Evaluation of thermal performance – calculation of heat loss – heat gain, estimation of annual heating & cooling loads, factors that influence thermal performance, analysis of existing buildings setting up an energy management programme and use management – electricity saving techniques

3. Energy Management & Audit:

Definition, energy audit, need, types of energy audit. Energy management (audit) approach-understanding energy costs, Bench marking, energy performance, matching energy use to requirement, maximizing system efficiencies, optimizing the input energy requirements, fuel and energy substitution, energy audit instruments and metering

4. Financial Management :

Investment-need, appraisal and criteria, financial analysis techniques simple payback period, return on investment, net present value, internal rate of return, cash flows, financing options, energy performance contracts and role of Energy Service Companies (ESCOs)

5. Energy Efficiency in Thermal Utilities and systems:

Energy efficiency in thermal utilities like boilers, furnaces, pumps and fans

6. Heat Recovery and Co-generation:

Heat recovery from ventilation, air co-generation of heat and electricity, heat recovery and bottoming cycles.

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Course coordinator

HOD