# GUJARAT TECHNOLOGICAL UNIVERSITY

## M.E Semester: 1

### Electrical Engineering

**Subject Name :** Energy Management

| Sr.No | Course content |
|---|---|
| 1. | Energy management:<br>Concept of energy management, elements of energy management, energy cost, energy performance, energy saving calculations, balancing energy use and requirement, maximizing system efficiencies, optimizing input energy requirement, Demand Side Management |
| 2. | Quality and Reliability of Industrial / Commercial Power Systems: Introduction, Harmonics in supply system, Voltage Sag, Power Factor Reliability analysis of power system |
| 3. | Economic aspects of energy audit:<br>Cost evaluation by ROI, IRR Cost evaluation by payback terms. Organization for energy management. Conservation measures and diagnostic review |
| 4. | Energy Audit & Case Studies:<br>Introduction, types and walkthrough energy audit. Energy audit at unit level, Industrial Audit approaches. Procedure for energy audit and equipments required. Comprehensive Energy audit Site testing Measurement & Analysis of Electrical System like Induction Motors, Transformers, synchronous Machines, Illumination system, Domestic Appliances Site testing Measurement & Analysis of Electrical System like Boilers, Furnaces, Refrigeration and Air-conditioning System |
| 5 | The Electric Utility in Industry:<br>Introduction, Electric utilities characterized by function, Different regulated electric utility frameworks, “Electric Utility” structure in deregulated industry, Energy conservation task in industry, Co – generation, Energy conservation in cement, textile, sugar, etc. industry Energy conservation in building. |
| 6 | Energy performance assessment of motors / variable speed drives<br>Introduction, Efficiency of the induction motor, Determining motor loading Field tests for determining efficiency, Performance evaluation of rewound motors, Format for data collection, Concept of variable frequency drives and Applications, Factors for successful implementation of variable speed drives, Information needed to evaluate energy savings for variable speed application |

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| 7 | Energy performance assessment of Pumps, Compressors, Blowers and Cooling Towers:<br>Introduction and types, Performance terms and definitions, Performance Analysis and suggestions |
| 8 | Modern Energy efficient technologies<br>Maximum demand controller , Automatic power factor controller, Energy efficient motors, Soft starters with energy saver, Energy efficient transformers, electronic ballast, occupancy sensors etc. Energy efficient lightning controls, Energy saving in transportation system especially electric vehicle, Energy saving in air conditioning system |

**Reference:**


1. A Guide to Energy Management by Barney L Capehart, William J Kennedy, Wayne C Turner
2. Energy Technology by S. Rao
3. Energy conservation techniques by P.M. Dave & M.N.sheth
4. Course Material for Accredited Energy Managers & Energy Auditors – Bureau of Energy Efficiency

   website : www.energymanagertraining.com, www.bee-india.gov.in