IV B.Tech I Semester

15AEE54-ENERGY AUDITING & DEMAND SIDE MANAGEMENT
(CBCC (DEPARTMENTSPECIFIC))

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Course Objectives:

This course enables the students to know

- *The growing worldwide concern for conservation of energy has reawakened interest in ecologically sustainability, processes and sources of energy.*
- *The better ways to conserve the energy from energy audit concepts, Representations and energy conservation schemes.*
- *Management skills and communication of energy manager.*
- *Various operational problems and remedies of motor and electrical devices.*
- *Evaluation of life time of machine based on time value money and demand, economic analysis with respect to demand side management.*

UNIT -IENERGY AUDITING

Energy Situation – World and India, Energy Consumption, Conservation, Codes, Standards and Legislation.Energy Audit- Definitions, Concept, Types of Audit, Energy Index, Cost Index, Pie Charts, Sankey Diagrams, Load Profiles, Energy Conservation Schemes.Measurements in Energy Audits, Presentation of Energy Audit Results.

UNIT –II ENERGY EFFICIENT MOTORS

Energy Efficient Motors, Factors Affecting Efficiency, Loss Distribution, Constructional Details, Characteristics - Variable Speed, Variable Duty Cycle Systems, RMS - Voltage Variation-Voltage Unbalance- Over Motoring- Motor Energy Audit.

UNIT –III POWER FACTOR IMPROVEMENT

Power Factor – Methods of Improvement, Location of Capacitors, Pf with Non Linear Loads, Effect of Harmonics on P.F., P.F Motor Controllers.

UNIT –IV LIGHTING AND ENERGY INSTRUMENTS

Good Lighting System Design and Practice, Lighting Control ,Lighting Energy Audit - Energy Instruments- Watt Meter, Data Loggers, Thermocouples, Pyrometers, Lux Meters, Tongue Testers ,Application of PLC's

UNIT –V ENERGY ECONOMIC ANALYSIS& DEMAND SIDE MANAGEMENT

The Time Value of Money Concept, Developing Cash Flow Models, Payback Analysis, Depreciation, Taxes and Tax Credit – Numerical Problems.Introduction to DSM, Concept of DSM, Benefits of DSM, Different Techniques of DSM – Time of Day Pricing, Multi-Utility Power Exchange Model, Time of Day Models for Planning. Load Management, Load Priority Technique, Peak Clipping, Peak Shifting, Valley Filling, Strategic Conservation, Energy Efficient Equipment. Management and Organization of Energy Conservation Awareness Programs.

BOS - chairman

Course Outcomes:

The student will have knowledge on the following concepts:

- *Current energy scenario, energy management, auditing, conservation, economic analysis and demand side management.*
- *Systematic knowledge and skill about assessing the energy efficiency, energy auditing and energy management.*

TEXT BOOKS:

1. Industrial Energy Management Systems,Array C. White, Philip S. Schmidt, David R. Brown, Hemisphere Publishing Corporation, New York.
2. Fundamentals of Energy Engineering - Albert Thumann, Prentice Hall Inc, Englewood Cliffs, New Jersey.

REFERENCE BOOKS:

1. Electrical Power distribution, A S. Pabla, TMH, 5th edition, 2004
2. Demand Side Management,JyothiPrakash, TMH Publishers.
3. Energy management by W.R. Murphy & G. McKay Butter worth, Heinemann publications.
4. Energy management by Paul o' Callaghan, Mc-graw Hill Book company-1st edition, 1998
5. Energy management hand book by W. C. Turner, John wiley and sons
6. Energy management and good lighting practice : fuel efficiency- booklet12-EEO
7. Recent Advances in Control and Management of Energy Systems, D.P. Sen, K. R. Padiyar, IndraneSen, M. A. Pai, Interline Publisher, Bangalore, 1993.
8. Energy Demand – Analysis, Management and Conservation, Ashok V. Desai, Wiley Eastern, 2005.

V. for
BOS-chairman