Subject: Energy Management (OE-5)								
Program: B. Tech. (Mechanical)				Subject Code: ME0420			Semester: IV	
Teaching Scheme				Examination Evaluation Scheme				
Lecture	Tutorial	Practical	Credits	University Theory Examination	University Practical Examination	Continuous Internal Evaluation (CIE) Theory	Continuous Internal Evaluation (CIE) Practical	Total Marks
3	0	0	3	16/40	***	24/60	***	100

Course Objectives

1. To make students aware of present energy scenario.
2. To make students understand the energy management approach.
3. To prepare energy audit report for different energy conservation instances.
4. To inculcate sustainable technology development competence into students.

Course Outcomes

1. Students will be aware of energy scenario in various energy sectors.
2. Students will understand the energy management approach.
3. Students will learn to prepare energy audit report for different energy conservation instances.
4. Sustainable technology development competence will be inculcated in the students.

COURSE CONTENT

UNIT-1 [04]

1 Energy Scenario

Classification of Energy, Indian energy scenario, Sectorial 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.

[06]

UNIT-2

2 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

UNIT-3 **[04]**

3 Energy Management and Energy Planning

Definitions and significance, Energy strategy, energy policy and energy planning, objectives of energy management, Trade – off between energy and environment, energy and economy, Transportation of energy, Seven principles of energy management.

UNIT-4 **[10]**

4 Energy Monitoring and Targeting

Defining monitoring & targeting, elements of monitoring & targeting, data and information-analysis, techniques – energy consumption, production, cumulative sum of differences (CUSUM). Energy Management Information Systems (EMIS).

5 Energy and environment, air pollution, climate change

United Nations Framework Convention on Climate Change (UNFCC), sustainable development, Kyoto Protocol, Conference of Parties (COP), Clean Development Mechanism (CDM), CDM Procedures case of CDM – Bachat Lamp Yojna and industry; Prototype Carbon Fund (PCF).

Text Books

1. Energy Technology Non-conventional, Renewable & Conventional, S. Rao, Dr. B.B. Parulekar, Khanna Publishers, Third Edition, Delhi – 2007.
2. Energy management Audit and conservation, Barun Kumar De, 2nd Edition, Vrinda Publications P Ltd.,2014.
3. Energy Engineering and management, Amlan Chakrabarti, PHI Publication, 2011.

Reference Books

1. Energy Conservation Guidebook, Dale R Patrick, Stephen W Fardo, CRC Press, 2nd Edition.
2. Handbook of Energy Audits, Albert Thumann, The Fairmont Press, 6th Edition.
3. Bureau Energy Efficiency Reference book: No.1, 2, 3 4
4. Energy Management Handbook, W.C. Turner, John Wiley and Sons, A Wiley Inter science Carbon Capture and Sequestration: Integrating Technology, Monitoring, and Regulation edited by E J Wilson and D Gerard, Blackwell Publishing.

Web Resources:

1. http://shodhganga.inflibnet.ac.in/bitstream/10603/46067/11/11_chapter%201.pdf
2. http://lab.fs.uni-lj.si/kes/erasmus/Energy%20Management%20Handbook.pdf
3. https://nptel.ac.in/courses/108106022/#

MOOCs:

1. Energy management systems: https://nptel.ac.in/courses/108106022/
2. Energy systems Engineering: https://swayam.gov.in/courses/5286-energy-systems-engineering
3. Energy and Development https://www.edx.org/course/energy-and-development-1