

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. Mechanical (Industrial Engineering) (Branch Code - 46)

Year – II (Semester – III) (W.E.F. July 2013)

Major Elective IV

1. Energy Engineering and Management (734602)

Sr. No.	Topic	Hours
1	Introduction: Energy scenario, various forms of energy, energy management and its importance, recent trends in energy conservation, Energy and development, energy demand and availability, energy crisis, conventional and non-conventional, renewable and non-renewable energy resources, environmental impact of conventional energy usage.	08
2	Energy Economics and Auditing: Payback period, time value of money, IRR NPV, life cycle cost, cost of saved energy, cost of energy generated. Auditing, methodology, analysis of past trends (plan data), closing the energy balance, laws of thermodynamics, measuring instruments, portable and online instruments.	14
3	Non Conventional Energy Systems: Cost-Benefit analysis of different non conventional sources of energy.	06
4	Monitoring and Targeting: Elements of monitoring and targeting, data and information, analysis techniques; Energy consumption, production, cumulative sum of differences.	10
5	Integrated Energy Systems: Concept of integration of conventional and non-conventional energy resources and systems, integrated energy system design and economics.	10
6	Contemporary Issues: Role of energy in economic development and social transformation, Energy & GDP, GNP and its dynamics, Energy Demand, Global and Indian trends ,Determinants of energy demand, energy productivity and management of energy demand.	08
		56

Term Work:

The term work shall be based on the topics mentioned above.

Practical / Viva:

The candidate shall be examined on the basis of term-work.

Books:

1. Witte, L.C., Schmidt, P.S., Brown, D.R., “Industrial Energy Management and Utilization”, Taylor and Francis.
2. Turner, W.C. and Doty, S., “Energy Management Handbook”, 7 Ed., Fairmont Press.
3. Hodge, B. K., “Alternative Energy Systems and Applications”, John Wiley & Sons.

4. Kreith, F. and Yogi Goswami, D., "Handbook of Energy Efficiency and Renewable Energy", CRC Press.
5. Kanchan Chopra and VikramDayal (2009), "High Economic Growth, Equity and Sustainable Energy Development", In (ed) Oxford Handbook of Environmental Economics, Oxford University Press, New Delhi.