

EMECVAC02 - Energy Auditing and Modelling

Unit I Energy Management

Energy management- various approaches, cost effectiveness, benchmarking, optimization of

energy requirement and maximization of system efficiencies. Fuels and energy substitution.

Unit II Energy Audit

Energy audit – need, preliminary audit, detailed audit, methodology and approach. Instruments for audit, monitoring energy and energy savings.

Unit III Assessment and Reporting

Evaluation of saving opportunities – determining the savings in INR, non-economic factors, Conservation opportunities, estimating cost of implementation- - the plant energy study report, importance, effective organization, report writing and presentation.

Unit IV Energy Audit Instruments

Basic measurements – Electrical measurements, Light, Pressure, Temperature and heat flux, Velocity and Flow rate, Vibrations, etc. Instruments Used in Energy systems: Load and power factor measuring equipments, Wattmeter, flue gas analysis, Temperature and thermal loss measurements, air quality analysis etc. Mathematical, statistical modelling and analysis.

Unit V Computer laboratory

Introduction to MS-Excel, Working with Spread Sheet, Power Point- Introduction to Power Point, Creating a Presentation/Slide, Adding Animation in Slide, Running a Slide Show. Statistical modelling tools

Presentation and Visualization – graphs, charts, 2D, 3D

Preliminary Auto CAD 2 D drawing exercise

Preliminary C and C++ Programming exercises

Text Books:

Energy Management Audit & Conservation by Barun Kumar De Publisher:
Vrinda Publications 2007

Hamies, Energy Auditing and Conservation: Methods, Measurements,
Management & Case Study, Hemisphere, Washington, 1980.

References:

Energy Management: W.R.Murphy, G.Mckay (Butterworths).

C.B.Smith, K.E. Parmenter. 2013. Energy Management Principle, Pergamon
Press Inc., Maxwell. House, Fairview Park, NewYork

Dryden, I.G.C. 2013. Efficient Use of Energy (Butterworth Scientific),
Willium clowes Ltd. Beccles and London.

Energy Economics -A.V.Desai (Wieley Eastern)

Energy conservation guidelines-Published by Bureau of Energy Efficiency
New Delhi, India.