P.G Diploma in Solar Renewable Energy

PGDRE-205: Energy Management and auditing (52 Hours)

Sub Code: PGDRE-205	No. of Lecture Hours Per week : 04
Total Ctedit:04	Internal Marks : 30 and Exam Marks: 70=100

Objectives of the paper :

- To know Energy Management
- To understand Financial and Project Management
- To understand Energy Action Planning and auditing

Module- I **10 Hours**

Energy and its various forms

Commercial and non commercial energy, primary energy resources, commercial energy production, energy pricing, energy security, energy conservation and its importance, electricity tariff, load management and maximum demand control, thermal energy of fuel, heat capacity, sensible and latent heat, heat transfer, stochiometric air – fuel ratio, fuel gas analysis.

Module- II **10 Hours**

Energy Management and Auditing

Concept of energy management programme, energy auditing services, basic components of an energy audit, types of energy audit. Industrial, commercial and residential audit planning, understanding energy costs, bench marking, energy performance index, understanding energy used pattern, system efficiencies, input energy requirements optimization fuel and energy substitution, energy conservation act and its features, duties and responsibilities of energy managers and auditors, energy audit instruments / tools.

Module- III **10 Hours**

Energy Action Planning

Energy management systems management commitment and energy conservation policy, energy performance assessment, data collection and management, analysis of data, baseline, and benchmarking, estimation of energy savings potential, action plnning, training planning.

Module- IV **12 Hours**

Financial and Project Management

Financial analysis techniques, simple payback period, return on investment, net present value, internal rate of return, cash flows and sensitivity analysis, financing options energy performance contracts and role of ESCs, project definition and scope, technical design and financing, project techniques, CPM and PERT, case studies.

Module- V **10 Hours**

Monitoring and Targeting:

Defining monitoring and targeting, elements of monitoring and targeting, Data and information-analysis- various techniques, Material balances for different processes, Energy balance, heat balance, methods for preparing process flow chart.

References.

- BEE Guide Book (2010) Energy efficiency in thermal utilities
- BEE Guide Book (2010) General aspect of energy management and energy audit,
- Capehart, Turner, Kennedy (2006.), guide to energy management. Fifth Ed. The Fairmount press
- Dr. H. Naganagouda (2014), Solar Power Hand Book,Director, NTC for solar technology , Banagluru.
- Other relevant books also be used.
- Thumann, Mehta (2001), handbook of energy engineering. Fifth Ed. The pair mount press.
- Thumann, Younger (2003), handbook of energy audit. Sixth Ed. The Fairmount press.
- Turner WC (2005). Energy management handbook, 5th edition, the Fairmont press.