

# International Winter School Manipal University Jaipur (IWSMUJ2022)

## Course Overview

**Name of course: Energy Audit**

Name of instructor: Mr. Hemant Raj Singh

Session: January 2022

Language of instruction: English

Number of contact hours: 36

Credit awarded: 03

### Objective of course

- To understand need and scope of Energy Conservation and Audit.
- To estimate the Energy Conservation Opportunities/Measures.
- To learn basics of Energy Audit Methodology.
- To analyse the existing Energy Consuming System and apply Retrofit.
- To check the feasibility of the Energy Conservation Measures by Financial Analysis.

### Syllabus

Introduction to the **Energy Conservation:** Energy Scenario, Thermodynamic basis of energy conservation, Energy Conservation Act and policies, Energy conservation in HVAC systems, thermal power plants and Energy conservation in buildings. **Energy Audit:** Definition, Energy audit-need, Types of energy audit, Energy management (audit) approach-understanding energy costs, Bench marking, Energy audit instruments. **Energy Management:** Definition and Objective of Energy Management, General Principles of Energy Management. Energy Management Skills, Energy Management Strategy. **Financial Analysis:** Simple Payback, IRR, NPV, Discounted Cash flow

### Organization of course

Total contact hrs 36		
1st week:	09 hrs (classes)	6 hrs (self-study/project)
2nd week:	09 hrs (classes)	2 hrs (Mid term exam/assessment/discussion)
3rd week:	08 hrs (classes)	2 hrs (End term exam)

**Mode of lectures:** online lecture/online videos/case study/ discussion/ workshop/ hands-on

### Course Plan

Lecture no.	Topic	Lecture mode	Instructor
L: 1-2	Energy Scenario, Energy Conservation: Introduction & Concept overview	Online lecture/video	Mr. Hemant Raj Singh
L: 3-4	Energy Conservation Act and policies	Online lecture/video	Mr. Hemant Raj Singh
L: 5-6	HVAC System: Fundamental Review and scope	Online lecture/video	Mr. Hemant Raj Singh
L: 7-8	Energy conservation in buildings	Online lecture/video	Mr. Hemant Raj Singh
L: 9-10	Energy Audit: Definition, Energy audit-need, Types of energy audit	Online lecture/video	Mr. Hemant Raj Singh
L: 11-12	Energy audit approach-understanding energy costs	Online lecture/video	Mr. Hemant Raj Singh
L: 13-14	Energy Audit Instruments	Online lecture/video	Mr. Hemant Raj Singh
L: 15-16	Bench Marking	Online lecture/video	Mr. Hemant Raj Singh

L: 17-18	Energy Audit Report	Online lecture/ video	Mr. Hemant Raj Singh
L: 19-20	Financial Analysis: Simple Payback	Online lecture/ video	Mr. Hemant Raj Singh
L: 21-22	Financial Analysis: IRR	Online lecture/ video	Mr. Hemant Raj Singh
L: 23-24	Financial Analysis: NPV, Discounted Cash flow	Online lecture/ video	Mr. Hemant Raj Singh

### **Brief profile of the instructors**

Mr. Hemant Raj Singh is an energy engineer (having experience of energy audit in process, hotels, and dairy industries) and a keen academician/researcher in the field of energy efficiency and renewable energy. He is currently working as an Assistant Professor in the department of Mechanical Engineering at the Faculty of Engineering, Manipal University Jaipur. He is the resource person for subjects like energy audit, energy efficiency, experimental solar thermal energy, etc.

