SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of CHEMICAL ENGINEERING	LP: Sub Code: OE18310 Rev. No: 00
B.E/B.Tech/~~M.E/M.Tech~~ : BIO / INT / EEE / ECE Regulation: 2018A PG Specialisation : NA Sub. Code / Sub. Name : OE18310 ENERGY MANAGEMENT Unit : I	Date: 28.12.2023

Unit Syllabus: **ENERGY RESOURCES – A GLOBAL VIEW**

Energy sources – Coal oil, natural gas – Nuclear energy – Hydroelectricity – Other fossil fuels – Geothermal – Supply and demand – Depletion of resources – Need for conservation – Uncertainties – National and international issues.

Objective: To give an overview on the various energy resources and its requirements.

Session No *	Topics to be covered	Ref	Teaching Aids
1.	Energy resources – An overview	T2 01-44	PPT, , Videos of related topics from the web, through Google Classroom
2.	Energy from Fossil Fuels – Conventional and other fossil fuels	T1 729-793	
3.	Nuclear Energy	T1 802-832	
4.	Hydroelectricity	T1 965-993	
5.	Geothermal Energy	T1 251-266	
6.	Supply and Demand for energy – National and Universal	T1 719-721	
7.	Depletion of resources and the need for conservation	T1 1065-1088	
8.	Uncertainities in energy availability and the need for alternative resources	T1 25-34	
9.	National and international issues	T1 25-34	
10.	Review of UNIT I		

Content beyond syllabus covered (if any): A detailed discussion on renewable and non renewable resources.

* Session duration: 50 minutes

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Sub. Code / Sub. Name: OE18310 ENERGY MANAGEMENT

Unit : II

Unit Syllabus: **ENERGY AND ENVIRONMENT**

Energy – Various forms – Energy storage – Structural properties of environment – Biogeochemical cycles – Society and environment population and technology.

Objective: To discuss about the various forms of energy and its interrelatedness.

Session No *	Topics to be covered	Ref	Teaching Aids
11.	Nature of energy	T1 1-12	PPT, , Videos of related topics from the web, through Google Classroom
12.	Various forms of energy - Kinetic	T1 13-20	
13.	Various forms of energy - Potential	T1 13-20	
14.	Storage of energy	T1 591-642	
15.	Structural properties of the environment	R4 9-14	
16.	Biogeochemical cycles - Water, Carbon	R4 78- 88	
17.	Biogeochemical cycles - Nitrogen, Sulphur and Phosphorous	R4 78-88	
18.	Society and environment	R4 284-306	
19.	Population and technology	R4 284-306	
20.	Review on UNIT II		

Content beyond syllabus covered (if any): Waste to Energy

* Session duration: 50 mins

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Sub. Code / Sub. Name: OE18310 ENERGY MANAGEMENT

Unit : III

Unit Syllabus : **ENERGY ALTERNATIVES**

Sources of continuous power – Wind and water – Geothermal – Tidal and solar power – MHD, fuel cells – Hydrogen as fuel.

Objective: To analyse the various prospects of available energy alternatives.

Session No *	Topics to be covered	Ref	Teaching Aids
21.	Sources of Continuous power - An overview	T1 305-330	PPT, , Videos of related topics from the web, through Google Classroom
22.	Wind Energy	T1 305-330	
23.	Hydropower	T1 965-993	
24.	Geothermal Energy	T1 251-266	
25.	Tidal energy	T1 521-547	
26.	Solar energy	T1 89-178	
27.	MHD	T1 666-684	
28.	Fuel Cells	T1 685-713	
29.	Hydrogen as a fuel	T1 794-798	
30.	Review on UNIT III		
Content beyond syllabus covered (if any):			

* Session duration: 50 mins

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Sub. Code / Sub. Name: OE18310 ENERGY MANAGEMENT

Unit : IV

Unit Syllabus : **MANAGEMENT OF ENERGY CONSERVATION IN CHEMICAL INDUSTRIES**

Analysis of scope and potential for energy conservation in chemical industries – Classification of chemical industries - Conservation in unit operation such as separation – Cooling tower – Drying – Conservation applied to refineries, petrochemical, fertilizers, cement, pulp and paper, food industries – Chloroalkali industries – Conservation using optimization techniques.

Objective: To explain the opportunities available for conservation of energy in different industries.

Session No *	Topics to be covered	Ref	Teaching Aids
31.	Classification of chemical Industries -Scope and Potential for Conservation	T2 825-892	PPT, , Videos of related topics from the web, through Google Classroom
32.	Conservation in unit operations	T2 825-892	
33.	Conservation in Refineries & Petrochemical Industries	T2 825-892	
34.	Conservation in Fertilizer industry	T2 825-892	
35.	Conservation in Cement Industry	T2 825-892	
36.	Conservation in Pulp and Paper Industry	T2 825-892	
37.	Conservation in Food Industry	T2 825-892	
38.	Conservation in Chloralkali industries	T2 825-892	
39.	Conservation using optimization techniques	T2 825-892	
40.	Review of Unit IV		

Content beyond syllabus covered (if any):

* Session duration: 50 mins

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Sub. Code / Sub. Name: OE18310 ENERGY MANAGEMENT

Unit : V

Unit Syllabus : **ENERGY AUDIT**

Definition, need and objectives - Types of energy audit - Basic components of energy audit - Preparing for audit - Energy audit instruments - Data collection - Safety considerations. Methodologies of conducting energy audit - Preliminary questionnaire - Review of previous records - Walk through audit - Energy flow diagram (Sankey diagram).

Objective: To demonstrate the significance of auditing in a process

Session No *	Topics to be covered	Ref	Teaching
41.	Definition, Need and Objectives	T1 1052-1064	PPT, , Videos of related topics from the web, through Google Classroom
42.	Types of Energy Audit - Analysis	T1 1052-1064	
43.	Basic components of energy audit -Preparing for audit	T1 1052-1064	
44.	Energy audit instruments - Data collection	T1 1052-1064	
45.	Safety considerations & Methodologies of conducting energy audit	T1 1052-1064	
46.	Preliminary questionnaire - Types	T1 1052-1064	
47.	Review of previous records	T1 1052-1064	
48.	Walk through audit	T1 1052-1064	
49.	Energy flow diagram (Sankey diagram)	T1 1052-1064	
50.	Review of UNIT V		

Content beyond syllabus covered (if any):

* Session duration: 50 mins

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TEXTBOOKS:

1. Rao, S. and Parulekar, B.B., Energy Technology, Khanna Publishers, 2005.
2. Rai, G.D., Non-conventional Energy Sources, Khanna Publishers, New Delhi, 1984.

REFERENCES:

1. Barney L. Capehart, Wayne C. Turner, William J. Kennedy, Guide to energy management, The Fairmont Press (2008).
2. Gramlay, G. M., "Energy", Macmillon Publishing Co., 1975.
3. Kenney, W.F., Energy Conservation in the Process Industries, Academic Press, (1984).
4. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, (2006).

	Prepared by	Approved by
Signature		28/12/23
Name	Dr.D.SIVAKUMAR	Dr.N.MEYYAPPAN
Designation	Asst. Professor	Prof & Head / CHE
Date	28.12.2023	28.12.2023
Remarks *:		
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD