

SRM UNIVERSITY
FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF CHEMICAL ENGINEERING
LESSON PLAN

Course Code : CH1102 **Course Title:** Renewable energy Engineering
Semester : IV Duration : Jan - May

REQUIRED BOOKS:

TEXT BOOK

1. Rai. G.D. “*Non Conventional Energy Sources*”, Khanna Publishers, New Delhi, 1999.
2. Sukhatme.. S.P. “*Solar Energ*”, Tata McGraw Hill Publishing Company Ltd.,New Delhi, 1997.
3. “*Renewable energy sources of conversion technology*”: Bansal..N.K Manfred Kleen Man and Michael Meliss, TMH Publication.

REFERENCES

1. Kothari. P, K C, Singal and Rakesh Ranjan, “*Renewable Energy Sources and Emerging Technologies*”, PHI Pvt. Ltd.,New Delhi, 2008
2. Godfrey Boyle, Renewable Energy, Power for a Sustainable Future, OxfordUniversityPress, U.K,1996.
3. Twidell. J.W. & Weir, A., Renewable Energy Sources, EFN Spon Ltd., UK,1986.
4. Tiwari. G.N. Solar Energy – Fundamentals Design, Modelling and applications, Narosa Publishing House, NewDelhi, 2002. 140 CHEM-Engg&Tech-SRM-2013
5. Freris, Wind Energy Conversion systems, Prentice Hall, UK, 1990.
6. Johnson Gary, L., Wind Energy Systems, Prentice Hall, New York, 1985.
7. Energy planning in Developed countries (U.N.), Oxford University Press,

Prerequisite :

Engineering Mathematics, Physics

Objectives

To familiarize:

- To emphasis the importance of renewable energy sources
- To familiarize various aspects of wind energy
- To familiarize various aspects of Bio-energy
- To familiarize various aspects of equipments used to collect solar energy
- To familiarize various applications of solar energy & to familiarize fuel cell

Internal marks Assessment Details:

Cycle Test-I	: 10 Marks
Surprise Test	: 5 Marks
Cycle Test-II	: 10 Marks
Attendance	: 5 Marks
Model Exam	: 20 Marks

Test Schedule

S.No	Test	Topics	Duration
1	Cycle Test-I	30%	2 periods
2	Cycle Test-II	30%	2 periods
3	Model Exam	100%	3 hrs

LEARNING OUT COMES

CH1102: Renewable energy Engineering

Students who have successfully completed this course will have full understanding of the following concepts

Course Outcome	Program outcome
1. This course helps the students to understand the technology involved in the production of energy from wind, 2. Bio-mass 3. Solar rays 4. Hydrogen 5. Biomass 6. Working and its operation 7. Design and Engineering	1. Students will demonstrate an understanding of the concepts of conservation of energy 2. To train students to identify, formulate and solve engineering problems in renewable energy processes. 3. Students will demonstrate an understanding of the concepts of energy (availability), efficiency and effectiveness. 4. Synthesize course information and apply it to practical, everyday issues on limited resources on Planet Earth. 5. Develop informed opinions on energy matters affecting society by applying critical thinking skills to evaluate public issues and current events involving engg.

LESSON PLAN

CH1102: Renewable energy Engineering

Session No	Topics to be covered	Time (Min)	Ref.*
Unit-I			
1	Introduction to India's energy	50	1-4
2	India's energy demand and supply management	50	1-4
3	Environmental aspects of energy utilization, Environment	50	1-4
4	Energy and Sustainable Development, Energy planning, Classification of Energy resources	50	1-4
5	Advantages and Disadvantages of Non-Conventional source	50	1-4
6	Renewable energy resources	50	1-4
7	Achievement potentials	50	1-4
8	Renewable energy achievement	50	1-4
9	Renewable energy Applications	50	1-4
Unit-II			
1	Basic concepts, Solar thermal systems	50	1-4
2	Flat plate and concentrating collectors	50	1-4
3	Solar passive space, Solar heating and cooling techniques, Solar desalination	50	1-4
4	Solar Pond, Solar cooker, Solar dryers, furnaces, pumping	50	1-4
5	Solar green house	50	1-4
6	Solar thermal power plant	50	1-4
7	Solar photo voltaic conversion	50	1-4
8	Solar cells	50	1-4
9	PV applications	50	1-4
Unit-III			
1	Availability of wind power plants	50	1-4
2	Power from the wind	50	1-4
3	Wind energy conversion systems	50	1-4
4	Wind turbines types, horizontal and vertical axis	50	1-4
5	Design of wind turbine	50	1-4
6	Magnus effect Performance	50	1-4
7	Wind energy Applications	50	1-4
8	New developments	50	1-4
9	Safety and environmental aspects	50	1-4
Unit-IV			
1	Biomass, usable forms, composition, fuel properties	50	1-4

2	Resources, Biomass conversion technologies	50	1-4
3	Bioethanol and Biodiesel Production	50	1-4
4	Developments.Energy farming, Biogas technology	50	1-4
5	Family biogas plants	50	1-4
6	Community and institutional biogas plants	50	1-4
7	Design consideration	50	1-4
8	Economy in rural application and rural development	50	1-4
9	Applications	50	1-4
Unit-V			
1	Tidal energy	50	1-4
2	Wave energy	50	1-4
3	Open and closed OTEC Cycles	50	1-4
4	Small hydro	50	1-4
5	Geothermal energy	50	1-4
6	Fuel cell technology, types, principle of operation	50	1-4
7	Fuel cell principle of operation,applications	50	1-4
8	Hydrogen energy production	50	1-4
9	Storage system	50	1-4