

1. Subject Code: **EP-402**

Course Title: **B.Tech project-II**

2. Contact Hours:

L:0 T:0 P:0

3. Examination Duration (Hrs.):

Theory:0 Practical: 0

4. Relative Weight:

CWS: 0

PRS: 0

MTE: 0

ETE:0

PRE: 0

5. Credits: 8

6. Semester: VIII

7. Subject Area: DCC

8. Pre-requisite: NIL

9. Objective: To familiarize the students to work in group and develop an independent understanding of engineering and analysis of engineering systems. He should also be able to write and present the work done during the course.

1. Subject code: **EP- 404**

Course title: **Alternative Energy Storage and Conversion Devices**

2. Contact Hours:

L:3 T:0 P:2

3. Examination Duration (Hrs.):

Theory: 3

Practical: 0

4. Relative Weight:

CWS:15PRS:15 MTE:30 ETE:40 PRE:0

5. Credits:

4

6. Semester:

EVEN

7. Subject area:

Renewable energy

8. Pre-requisite:

NIL

9. Objective:

The student will be able to understand about the various renewable energy resources their primary requirement and importance in various applications.

10. Detail of Course:

S. No.	Contents	Contact Hours
1.	Introduction to Renewable energy resources: Introduction to world energy scenario, solar radiation, Solar Geometry, radiation models; Solar Thermal, thermal efficiency, concentrators, evacuators, introduction to thermal systems (flat plate collector), solar architecture.	7
2.	Photo voltaic (PV) technology: Present status, solar cells technologies, Introduction to semiconductor physics, doping, P-N junction, Solar cell and its I-V characteristics, PV systems components, applications.	5
3.	Wind Energy: Wind speed and power relation, power extracted from wind, wind distribution and wind speed measurement by anemometer, Wind power systems: system components, Types of wind turbines, wind turbine efficiencies, Betz limit.	7
4.	Bio-Energy: Biomass and its uses, Classification of biomass, wood composition, Characteristics of biomass, Biomass conversion processes, Gasification and combustion of biomass, Gasifiers, pyrolysis,biogas, bio-fuel, bio-diesel, ethanol production.	8
5.	Energy storage & Conversion systems: introduction to battery systems, rechargeable batteries: lithium - ion, Pb-acid, Ni-Metal hydride batteries, fuel cells; classification of fuel cells, AFC, SOFC, PAFC etc. their construction and working, Efficiency of fuel cells, super capacitors.	8

6.	Hydel&Tidel Energy: Types of Hydro Power Plants, Hydro Power Estimates – Hydrological analysis, Effect of storage, power canal, Hydraulic Turbines – Types of turbines, their parts and working, Governing and controls of turbines, tidal energy and ocean energy.	7
	Total	42

11.Suggested Books

S. No.	Name of Books/ Authors	Year of publication/ Reprint
1.	Solar Cells by M. A. Green. / Prentice Hall	1981
2.	Principles of Solar Engineering by D. Y. Goswami, F. Kreith and J. F. Kreid/Taylor & Francis	2000
3.	Fundamentals of renewable energy processes by Aldo Vieira da Rosa. / Academic pressElsevier) USA	2005
4.	Hand book of Energy Audits by Albert Thuman, P.E.,C.E.M. Fairmont Press Inc.	2003/
5.	Bio fuels by David M. Mousdale/ CRC Press Taylor & Francis	2008
6.	Bio fuel Engineering by caye M. Drapchoetal. / McGraw Hill	2008
7	Solar Engineering of Thermal Processes by J. A. Duffie and W. A. Beckman John Wiley & Sons	2006
8.	Solar Energy - Principles of thermal collection and storage by S. P. Sukhat	1996

DRAFT SCHEME OF STUDY (Year 2,3,4 B. Tech Program)



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