

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