

SEMESTER <i>Seventh</i>	DEPARTMENT <i>Power Engineering</i>	COURSE TITLE <i>Renewable Energy Lab</i>
COURSE CODE <i>EP704</i>	HOURS: 3 UNITS: 1	COURSE SPECIFICATIONS <i>Practical Content</i>
1. Introduction to Types of Energy and Energy Resources. To get familiar with real systems of: <ul style="list-style-type: none"> ➤ The fuel based system. ➤ The impact of fossil based systems. 		
2. Solar Thermal Systems. To get familiar with real plants and collect information of : <ul style="list-style-type: none"> ➤ Conduction, reflectivity, radiation and transmissivity. ➤ Solar radiation spectrum measurements technologies, data and estimation. ➤ Types of solar collectors. ➤ Performance testing of solar collectors. ➤ Solar energy storage. ➤ Applications: water heating, buildings' heating and cooling 		
3. Solar Photovoltaic Systems. Use internet to get familiar with international projects in this field. Write reports about them and discuss the following: <ul style="list-style-type: none"> ➤ Operating principles of photovoltaic systems. ➤ Photovoltaic cell concepts. ➤ Cell, module array. ➤ Series and parallel connections. ➤ Maximum power point tracking. ➤ Applications: battery charging, pumping, lighting, cooling. 		
4. Wind Energy. To get familiar with real plants and collect information of : <ul style="list-style-type: none"> ➤ Wind turbines 		

- Electrical equipment.
- Wind energy systems.
- Performance and operation management.
- Grid integration and power quality.

5. Biomass Energy.

Use internet to get familiar with international projects in this field. Write reports about them and discuss the following:

- Biomass availability, types of its conversion and system design.
- Biogas generation.
- Energy plantation.

6. Hybrid System.

Use internet to get familiar with international projects in this field. Write reports about them and discuss the following:

- Range and type of hybrid systems.
- Case studied of: diesel, PV, wind, biomass systems and solar.