

ENIR 11 ENERGY AND ENVIRONMENTAL ENGINEERING

Objectives

- To teach the principal renewable energy systems.
- To explore the environmental impact of various energy sources and also the effects of different types of pollutants.

Course Content

Present Energy resources in India and its sustainability - Different type of conventional Power Plant--Energy Demand Scenario in India-Advantage and Disadvantage of conventional Power Plants – Conventional vs Non-conventional power generation

Basics of Solar Energy- Solar Thermal Energy- Solar Photovoltaic- Advantages and Disadvantages-Environmental impacts and safety.

Power and energy from wind turbines- India's wind energy potential- Types of wind turbines- Off shore Wind energy- Environmental benefits and impacts.

Biomass resources-Biomass conversion Technologies- Feedstock preprocessing and treatment methods- Bioenergy program in India-Environmental benefits and impacts.

Geothermal Energy resources –Ocean Thermal Energy Conversion – Tidal.

Air pollution- Sources, effects, control, air quality standards, air pollution act, air pollution measurement. Water pollution-Sources and impacts, Soil pollution-Sources and impacts, disposal of solid waste.

Greenhouse gases – effect, acid rain. Noise pollution. Pollution aspects of various power plants. Fossil fuels and impacts, Industrial and transport emissions- impacts.

Outcome

Students will be introduced to the Principal renewable energy systems and explore the environmental impact of various energy sources and also the effects of different types of pollutants.

Text Books

1. Boyle, G. 2004.' *Renewable energy: Power for a sustainable future*'. Oxford University press.
2. B H Khan, '*Non Conventional Energy Resources*'-The McGraw –Hill Second edition.
2. G. D. Rai, '*Non conventional energy sources*', Khanna Publishers, New Delhi, 2006.
3. Gilbert M. Masters, '*Introduction to Environmental Engineering and Science*', 2nd Edition, Prentice Hall, 2003.

References

1. '*Unleashing the Potential of Renewable Energy in India*' –World bank report.
2. Godfrey Boyle, Bob Everett and Janet Ramage.2010.'*Energy Systems and Sustainability. Power for a sustainable future*'. Oxford University press.