

Course Code : ME 723

Course Title : Renewable Energy

Credit Hours : 3

Course Description

Introduction and motivation to renewable energy resources as an alternative, Various energy resources and the energy dilemma in light of thermodynamics laws, Solar power, Heat transfer and storage, Solar heating and cooling, Advances in Material Technology, Photovoltaic, Concentrating solar power, Active, passive, hybrid solar systems, Wind energy, Bioenergy, Geothermal energy, Water and resources of energy, Regulations, environmental and political issue.

Course Objectives

Gain an understanding of the cost-benefit ratio of various alternative energy sources to see what is feasible on the large scale and what is not.

Understand some of the various obstacles associated with actual implementation of production line alternative energy facilities.

Do simple calculations regarding the cost of energy usage and the required infrastructure to deliver a certain amount of power.

Course Topics

- Week no. 1: Introduction and motivation to renewable energy resources as an alternative
- Week no. 2: Various energy resources and the energy dilemma in light of thermodynamics laws.
- Week no. 3: Solar power.
- Week no. 4: Heat transfer and storage.
- Week no. 5: Solar heating and cooling.
- Week no. 6: Advances in Material Technology.
- Week no. 7: Photovoltaic / 7th week evaluation.
- Week no. 8: Concentrating solar power.
- Week no. 9: Active, passive, hybrid solar systems.
- Week no. 10: Wind energy.
- Week no. 11: Bioenergy.
- Week no. 12: Geothermal energy / 12th week evaluation
- Week no. 13: Water and resources of energy.

Week no. 14: Regulations, environmental and political issue.

Week no. 15: Presentation on selected topics.

Week no. 16: Final examination

References

- B. Sorensen, "Renewable Energy: Its Physics, Engineering, Use, Environmental Impact, Economy And Planning Aspects," Academic Press, 2010.
- G. Boyle, "Renewable Energy: Power For A Sustainable Future," Oxford University Press, 2004.
- V. Nelson, "Introduction to Renewable Energy," CRC Press, 2011.