Mechanical Engineering Dept. Department

Syllabus
ME 423: Energy Conversion (3-0-3)

Course Catalog Description:

Energy sources and their classification, Conventional energy conversion, Power plant and vapor cycles, Renewable energy, Solar energy with emphasis on solar cells, Biomass, Hydropower, Wind energy, Geothermal energy, Nuclear fission and types of fission reactors.

Course Pre-requisites:

- ME 204: Thermodynamics II
- ME 315: Heat Transfer

Course Objectives:

1. To familiarize the students with various renewable and non-renewable sources of energy.
2. To provide the student with the tools to study an existing energy conversion device to analyze and asses its performance and efficiency.

Course Learning Outcomes:

CLO1. Understand the fundamentals of energy conversion systems and the various renewable and non-renewable sources of energy.

CLO2. Have the ability to study an existing energy conversion device to analyze and asses its performance and efficiency.

CLO3. Be able to collect the right set of data for an existing energy conversion system and carry out any subsequent processing and analysis.

CLO4. Be able to design a basic working prototype of an energy conversion system.

CLO5. Be aware of the technological advances in both the conventional and the renewable energy conversion devices.

Learning Resources:

- None

Lecture Assessment Plan:

Assessment Task	Week Due	Weight
In-class presentation	1	5.0%

Assessment Task	Week Due	Weight
Term Project	1	20.0%
Mid-Term Exam	1	20.0%
Final Exam	1	30.0%
Assignments/in-class activities	2	10.0%
Quizzes	3	15.0%

Lecture Weekly Schedule:

Week#	Topics
1	Introduction to Energy and its Sources
2	Overview of Energy Conversion
3	Fossil fuel energy
4	Fossil fuel energy (Continue)
5	Fossil fuel energy (Continue)
	Biomass
6	Biomass (Continue)
7	Nuclear Energy
8	Solar Thermal
9	Solar Thermal (Continue)
	Solar Photovoltaic
10	Solar Photovoltaic (Continue)
11	Wind energy
12	Wind energy (Continue)
13	Geothermal Energy
14	Hydro energy
15	Energy Storage and transportation