EE 5309-Renewable Energy Sources
Fall 2010

Instructors

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Class Time: 2:00-4:50 PM, Friday
Location:

Course Description

In this course fundamentals of renewable energy sources including those of solar, wind, and hydrogen will be discussed. Various aspects of energy harvesting, processing, and interfacing will be addressed. This includes introducing advances in material, electromechanical converters, energy storage, and power processing networks which form various blocks in a modern renewable energy system.

Course Purpose

With the increasing demand for energy consumption and environmental concerns, development of sustainable and clean sources of renewable energy has attracted the attention of government and industry. This course is aimed to develop necessary skills and an insightful understanding for design of a renewable energy harvesting system and their system related issues and challenges.

Prerequisite:

Consent of the instructors.

Course Text:

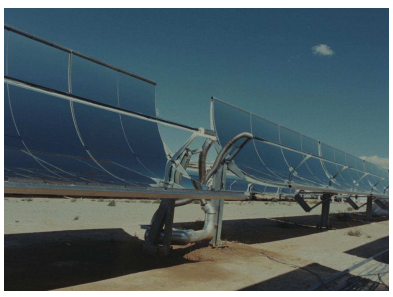
Various notes and resources will be provided by the team of instructors.

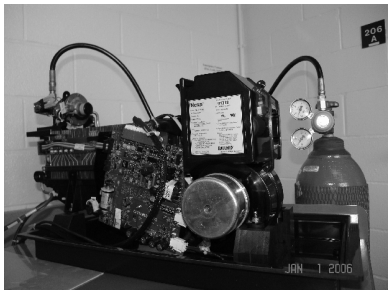
Grading:

Final project and presentation

Policy:

There is a **zero tolerance** policy in regards to **plagiarism**. Copying of homeworks, reports, and other assignments from classmates or World Wide Web constitutes academic dishonesty. Occurrence of such cases results in a grade of "F" for the course. Furthermore, instructor may report academic dishonesty to judicial affairs of the UTA.





EE 5309: Renewable Energy Systems

Week	Thursday	Comments
8/27	Topic-1	**Smart Grid and Distributed Generation (Lee)**
9/3	Topic-1	**Development of Wind Generation (Lee)**
9/10	Topic-1	**Wind Generation Development in ERCOT (Lee)**
9/17	Topic-1	**Impact of Wind Generation on the Power System Operations(Lee)**
9/24	Topic-1	**Techniques to Improve the Performance of Wind Generation (Lee)**
10/1	Topic-1	**Techniques to Improve the Performance of Wind Generation (Lee)**
10/8	Topic-2	**Fuel Cell operation, modeling, and dynamic behavior (Wetz)**
10/15	Topic-2	**Hydrogen harvesting and reformers, power converters for fuel cells (Wetz)**
10/22	Topic-3	**Energy storage devices (Wetz)**
10/29	Topic-4	**Hybrid operation and applications (Wetz)**
11/5	Topic-5	**Introduction to Solar Energy (Wetz)**
11/12	Topic-5	**Solar energy use and applications (Wetz)**
11/19	Project Presentation	
11/26	No-class	**Thanksgivings holiday**
12/3	**Project Presentation**	

Topic-1: Wind energy
Topic-2: Fuel cell systems
Topic-3: Energy storage
Topic-4: Hybrid systems
Topic-5: Solar Energy

Possible Report Topics on Wind Generations:

- Challenges and Possible Solutions of 20% Wind Vision.
- Improving the Low Voltage Ride Through (LVRT) Capability of the Wind Generation.
- Making Wind Generation a Dispatchable Unit.
- Operation Considerations of Wind Generation with Permanent Magnet Generators.
- Detection and Mitigation of Vibration and Shear Force on the Wind Generation Tower.

Possible Report Topics on Combined Areas:

- The Roles of Renewable Generations in the MicroGrid and Smart Grid Development.
- The economic future of renewable sources for use at home, work, and hybrid electric vehicles
- With the Development of Distributed Generation, Should we Allow Intentional Islanding Operation?
- Seamless Integration of Renewable Resources in the Smart Grid.