State University of New York

Department of Electrical and Computer Engineering

EGG250 – Renewable Energy – Spring 2015

Lecturer: Kenneth Bird

Office: REH 2nd Floor

Office Hours: T F, 9:00 AM - 10:00 AM

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Blackboard:

**Course Purpose:**

Deep concerns regarding the limited resources and adverse affects that modern (non-renewable) energy resources based on fossil and nuclear fuels have greatly increased public awareness and research activities in renewable energy resources. The existing energy systems pose a great threat to both human health and the natural environment and if measures are not explored and implemented, our lives and the lives of future generations will be in eminent danger. In particular, carbon dioxide and other greenhouse gases will create potentially irreversible changes to the earth’s climate in the form of global warming and have a direct impact on our physical well being.

**Course Description:**

Energy fundamentals and energy supply from fossil fuels and renewable resources as a result of solar power (such as direct solar radiation, and indirect forms such as bioenergy, water and wind power) as well as geothermal energy is studied and analyzed using a scientific and technological approach. The effects of decentralizing energy sources are also explored.

The instructor will take a practical approach towards the interdisciplinary subject matter with discussion of real-life applications. Hands-on experiences and solutions will be explored through the use of modern methods and tools. This is a “science/technology” course not an “energy and environmental policy” course. Successful completion of this course fulfills 3 credits of GE3 NSCI/SI.

**Student Learning Outcomes:**

Upon completion of the course the student is expected to be proficient in:

1. defining basic concepts/theories of non-renewable and renewable energies
2. applying scientific methods (and their analytic techniques) to renewable energy solutions
3. thinking critically:
   1. Compare possible solutions to problems and choosing the most appropriate solution based on given constraints.
   2. Look at social, economic, and environmental impacts of each solution.

**Required Textbook:**

Energy and the Environment, 2nd Edition by Robert A. Ristinen and Jack J. Kraushaar, Wiley Publishing, 2006.

**Supplemental Textbook (online for free):**

http://www.withouthotair.com/

**Relevant Websites:**

* [**http://www.eere.energy.gov**](http://www.eere.energy.gov/)
* [**http://www.energy.gov**](http://www.energy.gov/)
* [**http://www.nrel.gov**](http://www.nrel.gov/)
* [**http://www.doe.gov**](http://www.doe.gov)
* [**http://www.osti.gov**](http://www.osti.gov)

**Prerequisites:** College Math

**Evaluation:**

Homework 20%

Project 20%

Exam 1 20%

Exam 2 20%

Final Exam 20%

**Marking System:**

A 93-100

A- 90-92

B+ 87-89

B 83-86

B- 80-82

C+ 77-79

C 73-76

C- 70-72

D+ 67-69

D 60-66

F 0-59

**Course Outline:**

1. Energy Fundamentals
2. Fossil Fuels
3. Thermodynamics: Heat Engines, Heat Pumps, and Geothermal
4. Direct Solar Energy: Passive Solar, Solar Thermal, and Photovoltaics
5. Indirect Solar Energy: Hydropower, Wind Power, and Biomass
6. Energy Conservation
7. Transportation

**Policies:**

* **ADA Policy:** If you have documented disabilities, inform the instructor privately during the first week of class and make proper arrangements. Refer to the Student Handbook for SUNY New Paltz policies.
* **Attendance:** You are expected to attend lectures on a regular basis. In case of absence, it is your responsibility to obtain notes from your fellow classmates, not from the instructor.
* **Missed Coursework:** All coursework is your responsibility. There are no excuses for handing in coursework late. Coursework will be graded as late if not handed in on the due time/date, which is at the beginning of the class period on the due date. Coursework will be penalized one letter grade each day it is late.
* **Rescheduling:** There is no rescheduling unless emergencies arise related to medical or family matters. Rescheduling is contingent on the student presenting both documentation describing the reason(s) for the absence and contact information for the person providing the document(s).
* **Plagiarism:** Submitting material that is not your own work, including internet materials, is considered plagiarism, and will result in a failing mark and a report to the department chair and dean. Quoted material must be correctly cited. Refer to the Student Handbook section on Academic Integrity for a full discussion of policies on plagiarism, cheating, and forgery.