EET 3100 Renewable Energy
Fall 2014

Course: EET 3100 Renewable Energy – CRN #20880
Instructor: Dr. Fred Chiou
Office: ET 214 H
Phone: (801) 626-6470
Email: fredchiou@weber.edu
Office Hours: Mon, Wed (1:00 pm ~ 3:30 pm)
Class Time: Tue, Thu (1:30 pm ~ 2:45 pm) @ ET Building, Room 128

Text: None. (Class notes)

Course Overview:
The purpose of this course is for each student to learn the fundamental knowledge and technology of each type of renewable energy including solar energy, wind power, hydroelectric, geothermal energy, biomass, ocean energy. Knowing the limitation and the impacts of using fossil fuel energy, renewable energy can provide a long term solution and minimize climate change. The knowledge gained in this course will enable students to build an essential foundation towards the specific applications of renewable energy such as solar PV (Photovoltaic) systems, wind turbine systems and micro-hydro systems. Incentives, rebates and policies from federal, state and local power company will also be addressed in the class. The Students will learn how to get professional certifications if they are interested in developing a career in the area of renewable energy.

Student Outcomes:
Students will demonstrate and understand:

1. The limitation of fossil fuel (coal, petroleum and natural gas) and what are the alternative energy sources could be used to solve the potential problems in the future.
2. How to determine the energy conversion and efficiency.
3. Solar energy conversion, basic solar electricity theory, safety and NEC code related to the solar PV (Photovoltaic) systems.
4. Basic structures of solar PV systems, the function of each components and the performance analysis.
5. Analysis for the system integrations and the applications of different networking configurations of PV systems, like PV direct, Grid-direct, Battery-based, Stand-alone and hybrid system.
6. Wind energy conversion, wind turbine generators and applications.
7. Micro-hydro systems, components and operations, advantages and drawbacks.
8. The utilization of geothermal for electricity generation and hot water supply.
9. The other types of renewable energy like biomass and ocean tide energy.
10. Survey the incentives, rebates and policies from federal, state governments and local power company for the promotion of using renewable energy.
11. How to develop the career in the area of renewable energy. Learn the ways to obtain professional certifications for this career path.

Lecture Topic Outline:

	Topic
1	Course overview

EET 3100 Renewable Energy
Fall 2014

	Energy overview and why renewable energy
2	Incentives, rebates and policies (federal, state and local power company). Professional certifications for renewable energy.
3	Energy conversion and efficiency.
4	Solar energy conversion and applications.
5	Basic structures of solar PV systems, the function of each components and performance analysis.
6	PV system networking, PV direct, Grid-direct, Battery-based, Stand-alone and hybrid system.
7	Wind energy conversion and applications.
8	Wind turbine generators.
9	Micro-Hydro systems – advantages and drawbacks. Components and operations.
10	Geothermal energy
11	Biomass energy
12	Ocean tides and other renewable energy sources

Student Assessment:
The following student assessment criteria will be used:

1. Homework (15%)
2. Quizzes (15%)
3. Lab/Project assignments (15%)
4. Midterm exam (20%)
5. Final exam (35%)

Grading:
Final grades will be assigned based on the following breakdown.

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	63 ~ 66	D-	60 ~ 62
F	< 60				

Course Assessment:
The following course assessment criteria will be used:
1. Student review.
2. EET Department Chair and faculty review.
3. EET Advisory Committee review.
4. Individual student performance and test scores.

EET 3100 Renewable Energy
Fall 2014

Written Communications Requirements: Lab reports, written homework assignments.

Laboratory Experiments:
All data will be recorded in a laboratory book per the laboratory format. A typed laboratory report will be required for every lab. You must assemble and write up your own report. Your report should show and include original work such as changes in the schematic or different types of related designs you tried. You will be expected to be honest in reporting your data. If you do not get the same results as expected, then you should try to understand and explain why your data was different from what you expected. You need to spend time troubleshooting your circuits, and in your report, include a little section that explains what you did and what you learned. Include and show any calculations you did. Most important is a conclusion section that ties everything together and explains what was learned. Things that cannot be read will cause you to lose points.

Report Procedures:
Lab reports (in Word or PDF formats) should be uploaded to Canvas through **http://canvas.weber.edu**.
Your lab reports should include the following sections:

1. Introduction and Overview of the Experiment – Explain in general terms what is supposed to happen in the experiment. Include circuit performance specifications.
2. Equipment and Parts – List equipment, parts and materials used in the experiment.
3. Theory – Explain any principles, equations, or logical results predicted by fundamentals being learned.
4. Design Calculations – Show all steps from a system or block diagram to the final logic diagram.
5. Schematic Diagram of the circuit(s) to be built – Include device types, part values, reference designators, pin numbers, power supply voltages and grounds, and signal names.
6. Results – Neatly show your data and results. Use tables or graphs, and describe your results.
7. Conclusion – Summarize what you did and learned from the experiment.

A good test of your report is to ask a friend to read it. Another person should have enough information in the report to duplicate your work. **Lab reports will be due in one week at the start of the class meeting**. (If lab is performed on Monday then the report will be due at the start of the following Monday's class.)

Homework:
Homework will be assigned in class and is due in one week at the start of the class meeting. (If the homework is assigned on Wednesday it will be due at the beginning of class on the following Wednesday's class.)
Solutions to the homework will be given in the class after the homework is turned in. So no late homework will be accepted. Homework assignments should be completed using graph paper or engineering paper as many problems will require sketching graphs.

Policies:

Special Needs: If you require accommodations or services due to a disability, you must contact Services for Students with Disabilities (SSD) in the Student Service Center (Room 181, Tel:626-6413) at the **beginning** of the semester.

No cell phones during lecture or lab. ('**Off**' is good practice, '**Manner Mode**' if necessary)

Attendance is extremely important. If you miss class, it is **your** responsibility to obtain notes and assignments from your colleagues. Anyone missing more than 3 class periods without instructor notification (prior, or during if emergency) will receive a department drop.

All students are expected to abide by the Student Code:

http://www.weber.edu/ppm/Policies/6-22_StudentCode.html

Rights/Responsibilities:
The syllabus is the governing document for **EET 3100**. The decision made by the student to enroll and attend the course for the semester amounts to tacit consent to the terms of the syllabus.

Please review the WSU Policies and Procedures Manual student code regarding ethics (http://documents.weber.edu/ppm/6-22.html, specifically section IV. Academic dishonesty, as described will not be tolerated. Consequences may vary from grade adjustment to expulsion from the university.

****Note:** The instructor reserves the right to make amendments to the schedule as necessary.