ENGG*6660: Renewable Energy – Winter 2013

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Schedule Tuesdays and Thursdays, 10:00 am – 11:20 am. Lectures in Thorn 3402.

Prerequisite Graduate standing in engineering or consent of instructor.

Text None required.

Web Site A course website is maintained on Courselink (http://courselink.uoguelph.ca). Course announcements, homework assignments, readings and other materials will be posted on the web site. Some homework will be submitted electronically using the Courselink "Dropbox" function. Students are expected to check Courselink regularly.

Course Description

Engineering principles of renewable energy technologies will be covered using a learner-centered approach, with a specific focus on solar, wind and hydro energy. The design, economic and environmental constraints of each technology will be investigated. Students will learn to compare the relative merits of different energy technologies, and gain a knowledge base for further study in the field.

Project

Each student will conduct an independent research project related to the design or site-specific utilization of a specific renewable energy technology or application. The first phase of the project will be to conduct a literature review related to the project. For the second phase, each student will answer a practical question related to the topic by conducting original analysis, or design a solution related to the project. A list of potential project topics will be provided, or an alternative topic may be determined in consultation with the instructor. There are several deliverables for the research project:

1. A concise literature review on the project topic will be written to publishable standards, including proper referencing of reputable sources.
2. A report documenting the analysis or design solution a will be written to publishable standards, including proper referencing of reputable sources.

Literature Review

The project literature review should be based primarily on high-quality published materials (such as peer-reviewed journal articles). The literature review should include these components:

1. An overview of the topic.
2. Fundamental engineering and scientific principles of the topic.
3. Review of research conducted in the field. <u>The review should synthesize the findings from the literature. Do not just report the major findings of each paper in series.</u>

A minimum of 10 peer reviewed papers should be cited (however, more sources may be necessary for some topics). Literature reviews should be 1500 concise, information-dense words (excluding abstract and reference list). Include the word count at the end of the review.

Analysis or Design Project

The project analysis or design solution should include original work conducted by the student. This work should be guided by the findings from the literature review. The analysis or design report should be written to follow the literature review, and should include

1. A definition and explanation of the question to be answered, or the design problem to be addressed. You should refer directly to the results of your literature review.
2. Any additional background information that is needed to understand the work but is not included in the literature review.
3. Documentation of the design study and engineering analysis of the research project.
4. Results of testing and analysis, and a conclusion suggesting the direction that would be most fruitful for future work on the project.

The analysis/design report should be approximately 1500 words. It should be written to follow your literature review, and should be submitted with the literature review to allow a reader to understand it.

Reports (consisting of both literature review and design/analysis report) of sufficient quality will be published, with student permission, online in the Guelph Engineering Journal (http://www.soe.uoguelph.ca/webfiles/gej/).

Project Timeline

- Week 2: Thursday Jan. 17. Project topic selection due to instructor in class. All project topics will be finalized by end of the day on Friday Jan. 18.
- Week 6: Thursday Feb. 14: Draft literature review due before class (i.e. before 12:00 pm) for peer review. Submit in an editable electronic format (e.g. MS Word).
- Week 6: Friday Feb. 15: Students will receive three literature reviews to anonymously peer review.
- Week 8: Tuesday Feb. 26: Peer reviews of literature reviews are due before class.
- Week 8: Wednesday Feb. 27: Students will receive the reviews of their lit. reviews.
- Week 9: Tuesday March 5: Final literature review (for marking) is due before class (i.e. before 12:00 pm).
- Week 11: Tuesday March 19: Draft analysis/design papers must be submitted before start of class.
- Week 11: Wednesday March 20: Each student will receive three papers to anonymously peer review.
- Week 12: Tuesday March 26: Completed peer reviews will be due before class.
- Week 12: Wednesday March 27: Students will receive the reviews of their draft paper.
- Week 13: Tuesday, April 2: Test during lecture period.
- Week 13: Thursday, April 4: Final papers are due at the start of class at 10 am.

Homework Assignments

Regular homework assignments will be given weekly or biweekly. When determining marks, the lowest homework mark will not be used in calculating the final course grade. Homework assignments are due at the beginning of class one week after they are assigned. Homework assignments are individual assignments: assignment submissions should be the student's own work.

Final Test

A written test covering all the material presented during the course will be given during the lecture period on Tuesday April 2. Test solutions will be reviewed during the final lecture on Thursday April 4.

Grading The course grade will be determined according to the following weighting:

Homework Assignments	25%
Test	25%
Project	
Literature Review	
Quality of peer reviews provided to other students	5%
Report	20%
Analysis/Design Report	
Quality of peer reviews provided to other students	5%
Report	20%

Tentative Lecture Schedule

Week	Topics
1	Overview of Renewable Energy
2	Greenhouse Effect
3	Solar Resources
4	Solar Collectors
5	Wind Energy Overview
6	Wind Turbines
7	*Winter Break*
8	Wind Farms, Intermittency
9	Hydropower
10	Hydropower
11	Wave Energy, Energy Efficiency
12	Test Review
13	Test, Course Summary

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Graduate Calendar:
http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e1648.shtml

Note

The instructor reserves the right to change any or all of the above as course needs dictate, subject to University of Guelph Academic Regulations.