

Principles of Alternative Energy

ALT 200/ELT 160 | Syllabus | Winter 2017 | Edward Burkhead | BurkheadL@jccmi.edu

Time and Place: Monday 12:30 – 4:08pm, JW 211, 2/6/2017 – 5/1/2017

Description: This course will introduce students to alternative energy systems and their design and applications. The course will focus primarily on wind turbines, solar systems and hydrogen fuel cells. A basic understanding of electricity is highly recommended. [same as ELT 160]

Outcomes: After completing this course, students will be able to:

- A. Understand the history and global importance of the energy industry
- B. Discuss the benefits and drawbacks of fossil fuels and their environmental impact
- C. Perform basic calculations and measurements related to heat and electrical energy
- D. Design basic solar and wind energy systems.
- E. Recognize the components of solar, wind, geothermal, wave, tidal, and biomass systems
- F. Discuss the problems and drawbacks of alternative energy
- G. Understand how geography impacts alternative energy systems
- H. Identify ideal sites for different alternative energy systems
- I. Discuss the economic and social impacts of alternative energies
- J. Explain basic strategies to reduce energy consumption
- K. Calculate costs and efficiencies of solar and wind systems

Text: *Alternative Energy Sources and Systems*, Steeby. Other readings [online]

Grading: Your grade will be determined out of a total of 500 possible points earned throughout the duration of the course. The point break down is as follows:

Quizzes (4): 200 points

Projects (4): 160 points

Homework: 80 points

In-Class work: 60 points

TOTAL: 500 points

Final Grades will be assigned for the following scores:

4.0 92 - 100%

3.5 85 - 91%

3.0 80 - 84%

2.5 75 - 79%

2.0 70 - 74%

1.5 65 - 69%

1.0 60 - 64%

0.5 50 - 59%

0.0 0 - 54%

Projects will include writing, presentations, group design work, and research.

Attendance and participation are mandatory. Failure to attend each class and participate with enthusiasm could result in a lower grade. If you are unable to attend due to sickness, death in the family, the apocalypse, or other Acts of God, please e-mail the instructor as soon as you are able.

Late-work is accepted if a reasonable excuse can be given. Points will be deducted accordingly. Exceptional work delivered on time may be given extra credit.

To pass this course, you need a 2.0 grade, which requires a minimum of 315 points.

Only courses with passing grades count toward graduation or a certificate. Other colleges transfer in only courses with passing grades. Many financial aid sources, including most employers, require passing grades.

Incompletes

No incomplete grades will be given in this class except under extraordinary circumstances and if the student has completed at least 75% of the work and has at least 2.0 in the course. The grade of "I" is not awarded to students who did not attend, or seldom attended, or to those who simply are not pleased with their final grades. Students receiving an "I" may submit the remaining work during the next class offering by attending the remainder of the class. Or, talk to me about specific arrangements to complete the remaining work in a manner that is acceptable to me. Students do not redo work that had already been graded. Students may drop the class up to the drop deadline as specified on the website calendar. See

http://www.jccmi.edu/student-services/registration/grading_system.htm for more info

Attendance, Participation grades (HQV), and Final Grades:

Attendance is perhaps the most important predictor of success in this course. If you are unable to attend a class, inform the instructor as soon as possible. Based upon circumstances, any missed due dates or late work may be penalized or rejected at the discretion of the instructor. Typically a 10% reduction per day late will be assessed.

Participation is not the same as showing up. It is important that you contribute to and benefit from the learning of others by sharing your observations, insights, and questions.

You will receive 3 HQV grades during the semester (see Participation Reporting, p16 of the JCC catalog). You can view your HQV grades and final grades in e-services on the JCC website, by clicking the students menu, then clicking the grades by term hotlink.

* V means verify. It verifies that you are participating

* H means you need help. You will be contacted by the Center for Student Success.

* Q means you have been withdrawn from the course due to lack of attendance. Contact student services

Please Note:

Students with disabilities who believe that they may need accommodations in this class are encouraged to inform the instructor and/or contact the office of Learning Support Services at 787-0800, extension 8270/8553 as soon as possible to ensure that such accommodations are implemented in a timely fashion.

College Closing:

Any cancellation of classes will be announced on the local radio stations. You can also call the switchboard (800) 787-0800. Also see <http://www.jccmi.edu/info/closings.htm>

In the case of a school closing I will email you with further instructions regarding our next class.

Academic Honesty Policy

The JCC Academic Honesty policy states that **academic honesty is expected of all students**. It is the ethical behavior that includes producing their own work and not representing others' work as their own, either by plagiarism, by cheating, or by helping others to do so. **Cheating is obtaining answers/materials from an outside source without authorization**. Cheating includes, but is not limited to: Plagiarizing in all forms, using notes/books without authorization, copying, submitting others' work as your own or submitting your work for others, altering graded work, falsifying data or exhibiting other behaviors generally considered unethical.

Plagiarism is the failure to give credit for the use of material from outside sources. Plagiarism includes but is not limited to: Using data, quotations, or paraphrases from other sources without adequate documentation, submitting others' work as your own, or exhibiting other behaviors generally considered unethical. **Faculty members who suspect a student of academic dishonesty may penalize the student by taking appropriate action up to and including assignment a failing grade for the paper, exam, or the course itself.**

<http://www.jccmi.edu/administration/deans/Policies/Academic%20Honesty%20Policy.doc>

Conduct:

Students are expected to behave in a mature, respectful manner in the classroom

and laboratory. Use of computers, tablets, and phones during class is distracting to students and instructors.

Do not be this person! If you need your phone on to monitor for emergencies, discuss options with the instructor prior to class. All cell phones and other devices will be turned off during exams or tests (calculators excluded).

Calendar

Date	Class #	Module	Topic	Assignments Due
2/6/2017	1	1	What is Energy? What do we use it for? Fundamentals of Energy and Electricity	
2/13/2017	2	1	Energy Use and HVAC/Heat Transfer Fundamentals/Fossil Fuels and Pollution	Energy Use Calculation
2/20/2017	3	1	Environmental Issues	Environment Presentation
2/27/2017	X		Spring Break!	
3/6/2017	4	2	Intro. to Solar Thermal and PV Systems	Module 1 Quiz
3/13/2017	5	2	Designing PV Systems	Solar Reading
3/20/2017	6	2	Advanced Solar Technology	DIY Solar
3/27/2017	7	3	Intro. to Wind Systems	Module 2 Quiz
4/3/2017	8	3	Designing Wind Turbines	Wind Reading, Wind Design
4/10/2017	9	4	Wave and Tidal Energy	Module 3 Quiz
4/17/2017	10	4	Geothermal Energy and Fuel Cells	
4/24/2017	11	4	Biomass, Biogas, Biofuels	Alt Alt Energy
5/1/2017	12	4	Course Wrap	One Question Final

Module 1: Energy, Society, and the Environment

Module 2: Solar

Module 3: Wind

Module 4: Other Alternative Energy Sources