

# ME 417: Design of Alternative Energy Systems

## Syllabus

Spring 2010

MWF 9:10-10:00 Room 106 Bessey Hall

Professor André Bénard

2425 Engineering Building

Office Hours: MW 10-11:30am

Office phone: 432-1522

Email (preferred): [benard@msu.edu](mailto:benard@msu.edu)

Note: I try to respond as quickly as possible to emails, if you do not receive a reply within 24 hours, please resend again (keep in mind that sometimes I cannot check email messages on weekends).

Course web page: [www.egr.msu.edu/classes/me417/benard](http://www.egr.msu.edu/classes/me417/benard)

Goals are to:

1. Provide an overview of energy systems that may replace fossil fuel systems
2. Develop modeling skill as they apply to energy systems
3. Develop design skill as they apply to energy systems
4. Develop an understanding of non-technical issues associated with alternative energy systems

### Course Outline:

<b>Topics</b>	<b>Week</b>
Introduction and overview	Week 1
Sociological, political and economic aspects	Week 1
Review of basic thermodynamics and thermal sciences	Week 2
Fuel Cells	Week 3
Fuel Cells	Week 4
Ocean Energy	Week 5
Ocean Energy	Week 6
Wind Energy	Week 7
Wind Energy	Week 8
<b>Spring Break</b>	Week of 3/3
Solar Energy	Week 9
Solar Energy	Week 10
Geothermal Energy	Week 11
Nuclear Energy	Week 12
Nuclear Energy	Week 12
Biomass Energy	Week 13
Biomass Energy	Week 14
Alternative Fossil Fuel Energy	Week 15

## Projects

1. Essay and presentation on pros and cons of an alternative/renewable energy system (2-student teams)
2. Project 1: Design of a fuel cell system (2-student teams)
3. Project 2: Design of a wave or wind energy system (2-student teams)
4. Project 3: Design of a solar energy system( 2-student teams)
5. Policy recommendation (individual project – presentation during Finals week)

Project #1 will involve a 1-minute presentation and a 1-minute question period

## Quizzes

There will be four 30-minute quizzes during the semester to test a student's ability to use simple predictive models discussed in class. All quizzes will be closed book and notes. All the required formulas, equations, tables will be provided.

## Grading

Essay/Policy (1 & 5)	5%
Each quiz	10% ( x 4)
Policy recommendation	5%
Each project	15% (x 3)

## Final Grade:

The following scale will be used as guide how to determine the grade division of the class. This scale provides a minimum grade that you may have for the class. I will adjust the scale based on groups appearing in the distribution of the grades at the end of the course.

Course Total (%)	Course Grade
90 and above	4.0
85-90	3.5
80-85	3.0
70-80	2.5
60-70	2.0
55-60	1.5
50-55	1.0
Less than 50	0.0

**Assignment Due Dates (Tentative)**

<u>Assignment</u>	<u>Due Date</u>
Essay/Presentation	1/22/10
Quiz #1	2/5/10
Project 1	2/19/10
Quiz #2	2/26/10
Project 2	3/19/10
Quiz #3	3/26/10
Project 3	4/16/10
Quiz #4	4/23/10
Policy Recommendation	Final Exam Period