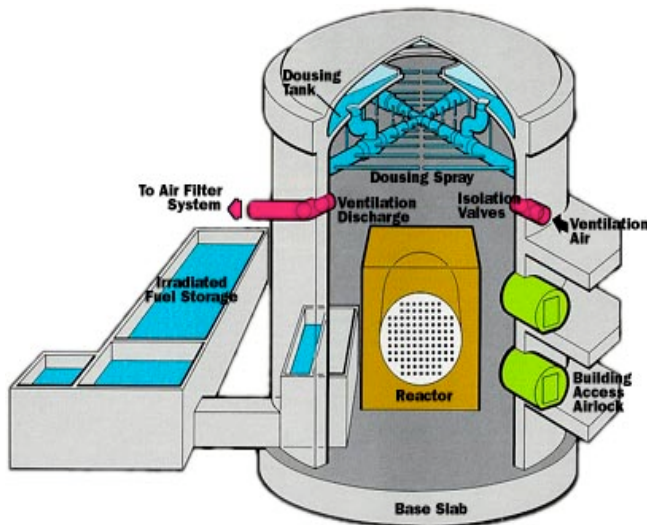


ES238 Introduction to Energy Systems

Clarkson University

Fall Syllabus 2009



Instructor: Professors D. Bohl and K. D. Visser,

Lecture: T & Th 4:00 – 5:15 CAMP 177

Course Site: www.clarkson.edu/~visser/es238

Office Hours: Bohl: Mon. 9-11, Tu. 2-4, Th. 1-2; Visser: Tu. 9-11:30, Th. 9-11:30

Prerequisites and Corequisites: none

Learning Objectives: Students will be able to utilize basic scientific and engineering principles to analyze fundamental energy systems and use those principles to critically review relevant literature. Topics include energy supply and demand systems, life cycle analysis, energy efficiency, and the environmental consequences of various sources such as global climate change in the 21st century.

Required Text: Energy Systems Engineering Vanek and Albright, 2008

Resource Texts:

Hubbert's Peak: The Impending World Oil Shortage, Kenneth S. Deffeyes

The Myth of the Oil Crisis: Overcoming the Challenges of Depletion, Geopolitics, and Global Warming, Robin M. Mills

Beyond Oil: The View from Hubbert's Peak, Kenneth S. Deffeyes

The Party's Over: Oil, War and the Fate of Industrial Societies, Richard Heinberg

Out of Gas, David Goodstein

End of Oil: On the Edge of a Perilous New World, Paul Roberts

Learning Outcomes:

1. Develop an understanding of the concepts of energy, power and work
2. Realize the relationship between the current socio/economic state and accessibility to low cost abundant energy
3. Understand the relationship between climate change and energy consumption
4. Perform simplified analysis of non-renewable energy (fossil fuels, nuclear) systems
5. Develop a sense of critical thinking about energy and its impact on our society

Attendance: Attendance is expected for every class as students are responsible for the material presented and class discussions held during class. It is hoped that students conduct themselves as professionals and make every effort to learn as much as they can on the subject. Attendance in class is one of those efforts. If a student is absent for an in-class requirement and does not discuss this with the instructor no grade will be given.

Assignments: Assignments are due in class on the date due. Late assignments will be accepted and are *reduced in grade by 50%* for each day late.

Course Outline:

Week	Topics
08/25, 27	Introduction, Energy Background
09/01, 03	Energy Sources and Usage
09/08, 10	GROUP BASED PROBLEM /Sustainability and Carrying Capacity
09/15, 17	Systems Tools for Energy Systems
09/ 22, 24	Economics of Energy Systems
09/29	***** <i>Fall Recess</i> *****
10/01	Fossil Fuels
10/06,08	Peak Oil Issues
10/13, 15	Combustion Systems
10/20, 22	Climate Change and Climate Modeling
10/27, 29	Carbon Sequestration
11/03, 05	GROUP BASED PROBLEM
11/10, 12	Nuclear Power
11/17, 19, 24	Energy Politics
11/26	***** <i>Thanksgiving Recess</i> *****
12/01	Renewable Energy Strategies
12/03	Discussion

Evaluation Methods: The course grade based on written assignments (group and individual) and class participation as detailed below. See additional handouts for details on the individual items below:

Group Problem Based Assignments	40%
Individual Semester Position Paper	30%
Course Reflection Journal	20%
Class Participation	10%