



THE GEORGE WASHINGTON UNIVERSITY
Engineering Management and Systems Engineering (EMSE) Department
Environmental and Energy Management Program

E&EM web page: <http://www.gwu.edu/~eem>
E&EM newsletter: <http://www.gwu.edu/~eemnews>

EMSE 6260: Energy Management Course Syllabus

Wednesdays, 7:10 pm – 9:40 pm
1776 G Street, NW; Room 148

3 credit hours; 2.5 hours/session; one lecture
session/week; 14 weeks; required course for E&EM
concentration.

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COURSE DESCRIPTION

Course will get you thinking on questions such as:

- Can we use energy and its concepts to understand what is happening to our economy?
- Can we achieve sustainability at our present rate of consumption of natural resources?
- Can carbon taxes or tradable permits reduce our production levels of carbon dioxide?
- How serious are the health effects and risk of energy related effects like global climate change and urban air pollution?
- How can we design our buildings to consume less energy?
- Can we continue to use cars for transportation?

All assignments are directed towards enhancing your creativity and enabling you to consider all aspects of an issue.

This course aims to enable you to focus on your creativity and ability to think for yourself. The main objective is for you to fully comprehend the technical, environmental, policy, etc. issues related to our use of energy and the development of sustainability. You will be digging into a topic of interest to you through a research project, while also providing “perspectives” on issues covered in previous classes. ***Emphasis in grading will involve your contributions, conclusions, creativity and effort behind the deliverables.*** At the end of this course, students will be able to identify energy related issues and challenges, as well as technologies, policies and other approaches in overcoming these challenges.

REQUIRED TEXT

Synergies for Sustainable Energy

Author: Elvin Yüzügüllü

Publisher: Artech House

ISBN-10: 1608075430

ISBN-13: 978-1-60807-543-0

GRADING

	%
class participation	10
reflections	10
mid-term exam	20
research project	60
TOTAL	100

RESEARCH PROJECT	% Weight	
proposal	10	
presentation	20	
paper	70	
TOTAL	100	
SCORING CRITERIA (paper)	points	Weight
literature	1-10	2
expression	1-10	1
contributions and conclusions	1-10	3
general format	1-10	1
creativity and effort	1-10	3

CLASS SCHEDULE & ASSIGNMENTS

SESSION #/DATE	TOPICS	ASSIGNMENTS
#1/January 15	CLASS INTRO & Background and Trends	Read Chapter 1-- Yüzügüllü
#2/January 22	Fundamentals of Energy Science & Energy Futures	(Refer to Chapters 3 & 4—Randolph & Masters) Reflections due
#3/January 29	Life Cycle Energy Analysis	(Refer to Chapter 5—Randolph & Masters) Reflections due
#4/February 5	Energy Efficiency	Read Chapter 2-- Yüzügüllü Reflections due
#5/February 12	Renewable Electricity—part 1	Read Chapter (3.1-3.2)--- Yüzügüllü Reflections due Project proposals due
#6/February 19	Renewable Electricity—part 2	Read Chapter 3.3-- Yüzügüllü Reflections due
#7/February 26	Renewable Electricity—part 3	Read Chapter (3.4-3.6)—Yüzügüllü Reflections due
#8/March 5		MID-TERM EXAM
Week of March 10-15		SPRING BREAK
#9/March 19	Hydrogen and Fuel Cells	
#10/March 26	Alternative Vehicles and Fuels & GUEST SPEAKER (Amit Ronen, Director, GW Solar Institute)	Read Chapter 4-- Yüzügüllü Reflections due
#11/April 2	Energy Storage	Read Chapter 5-- Yüzügüllü Reflections due
#12/April 9	Project Presentations	Project final papers due Project presentations—part 1
#13/April 16	Project Presentations	Project presentations—part 2
#14/April 23	Policy and Planning & Market Transformation to Sustainable Energy &	Read Chapter 6-- Yüzügüllü (Refer to Chapters 16-18—Randolph & Masters)

ASSIGNMENT DETAILS

REFLECTIONS

These should be **max one or two pages long** involving your thoughts about some aspect of the lecture the preceding week(s). You can research some particular aspect, follow up on a thought you have about a new aspect, find news about a recent development, etc. Different views and new and different material is sought here. References are encouraged and if the material is of obscure and not well known sources, the bias should be discussed.

Each week that a reflection is due, **all students are to submit the short written material**. The first portion of the class will be devoted to discussions of these reflections. The instructor will randomly select/invite several students to shortly talk about their reflections (and the rest of the class will be encouraged to engage in the discussions).

In addition, a weekly list of energy-related events going on in D.C. will be provided to students as a resource. For **one of the seven reflections**, students are to attend an event of their choice, and report back to the next class, in the same format as the typical weekly reflections.

RESEARCH PROJECT

A significant part of the course will entail the development of a research project dealing with energy management-related issues. Project deliverables will consist of the following:

1. Short Project Proposal:

Due February 12

This will be a **1-2 page maximum** written document. It is to contain the following elements:

- Statement of the problem/case study:
 - What is it?
 - Why is it of interest?
- Description of the project:
 - What is proposed to be done?
 - What sources do you anticipate using?
- Identification of project tasks.
- Schedule of project tasks and work assignments.

2. A brief (5-7 minute) oral presentation on key insights gained:

Due April 9 & April 16

You will give a short presentation about what you learned from your project – highlights of key things you discovered.

3. A (maximum 20 page) written final project report.

Due April 9

Format: 12 font, double-space, double-sided print. Page limit of 20 pages does **not** include cover, Table of Contents, References, and Appendices (if any).

You will be graded on the proposal, oral presentation, and paper separately - you will get one grade for the project which is a **combination** of these three grades.

Regarding formats for written reports, there are many published guidelines on technical report writing. Any standard format can be used for the written reports. One widely accepted such guideline, which is available in the Gelman Library, is **A Manual for Writers of Term Papers, Theses and Dissertations by Kate L. Turabian**,

University of Chicago Press, 1989.

Important Note: Wikipedia and other lower references will not be acceptable. When you use references that are not peer-reviewed, you need to be the peer reviewer. This, primarily, means web sites. You are expected to include in your submissions annotations - a sentence or two that result from your peer review.

Research projects may be developed in categories such as:

1. **Case Studies:** Case studies may involve investigations into specific energy management issues, such as methods for generating electricity, global climate, transportation, resources, etc.
2. **Analytical Investigations:** Projects in this category can focus on the analysis of major topics in the areas of technology, law or policy as related to energy management. Examples include economic analyses, resource availability and sustainability; inquiries into recent developments in energy-saving technologies; investigations into the results of recent applications of relatively new technologies; etc.
3. **Current Issues:** Projects in this category would focus on current developing issues. For example, such projects could investigate recent developments energy use trends; development and deployment of renewable energy technologies; major active laws and policies such as carbon tax and other similar taxes; cost of energy; geopolitics; etc.
4. **Miscellaneous:** Since the purpose of this project is to stimulate creativity and not to artificially restrict the range of acceptable topics, any other current, relevant or appropriate topic related to a major subject involving energy management may be acceptable.

EMERGENCY INFORMATION

What to do if the instructor does not arrive:

If the Instructor does not arrive for the class at the designated starting time and has not notified the class of a late starting time or the cancellation of the class, the students should wait in the classroom for at least 30 minutes before departing. One member of the class should be selected to notify the EMSE Department of the Instructor's absence by calling the EMSE Department at 202-994-7541 on the next business day.

What to do in the case of an emergency:

- All students should familiarize themselves with the emergency evacuation routes from the classroom that the course is being taught in. Pay particular attention to understanding how to egress if all power is out and there is no light.
- In the event of an emergency evacuation of the class building, the students are to assemble at: **corner of 18th and G Streets** (do not depart until the Instructor has accounted for all of the students).

General emergency preparedness information:

- GW Campus Advisories. Students should check the GW Campus Advisories Web Site at: <http://www.campusadvisories.gwu.edu/index.cfm> for current information related to campus conditions, closures, safety information and any other information concerning events that may disrupt normal operations.
- GW Alert. All students, faculty and staff registered in the GW banner system **GW will receive emergency alerts, notifications and updates sent directly to their GW email address.** If individuals elect to receive these alerts on a mobile device they may log on to GWeb Information Web Site at <https://banweb.gwu.edu> and update their contact information to include mobile devices.