ENV 312  Energy and the Environment  
Course Syllabus

Overview

Basic Information

Program: Program in Environmental Science  
Course Prefixes: ENV 312  
Course Title: Energy and the Environment  
Credit Hours: 4  
Class Hours: Monday from 6:00 to 9:00 PM  
Class Location: Science & Engineering Building. Lower Level Room 93  
Course Website: http://personalwebs.oakland.edu/~leidel/ENV312/index.htm

Instructor Information

Name: James Leidel  
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Rochester, MI  48309  
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OU Catalog - Course Description

Basic facts of energy: sources, forms, the roles it plays, and its ultimate fate. Includes study of laws limiting energy utilization, energy flow patterns, effects of energy use on the environment and analyses of current energy related problems.

Prerequisite: Sophomore standing; mathematics proficiency and MTH 011 level.

Required Text:

Energy and the Environment  
Robert Ristinen & Jack Kraushaar  
384 pages, paperback  
J. Wiley & Sons (1998)  
ISBN 0471172480
Further Reading (optional):

Renewable Energy (2\textsuperscript{nd} edition)
Godfrey Boyle
452 pages, paperback
ISBN 0199261784

Diet for a Small Planet
(20 Annv. edition)
Frances Moore Lappe
528 pages, paperback
Ballantine Books (1991)
ISBN 0345373669

Course Goals and Objectives

1. Comprehend existing world, US, and local energy use and its impact on the environment, economy, and global climate. Students should come away with a thorough understanding of fossil fuel pollutants, acid rain, issues with nuclear energy, ozone depletion, and climate change.

2. Comprehend both conventional and renewable energy resources, their magnitude, availability, as well as past, present, and forthcoming technologies for capturing and integrating these resources into our energy infrastructure.

3. Be familiar with energy conservation, conventional energy conversion, & combined heat and power.

4. Be familiar with the theory underlying alternative energy conversion technologies.

Course Policies and Procedures

Web Site

There is a web site for this course containing up to date syllabus, schedule, assignments, and all handouts. For the most part, paper copies will not be given, and it is your responsibility to check the site frequently for updates.

The web site address is:

http://personalwebs.oakland.edu/~leidel/ENV312/index.htm

Field Trip(s)

One lecture period will consist of a field trip to the Oakland University photovoltaic installation at the 4000 Meadowbrook Drive of the University Student Apartments. The solar PV lectures will be given on site at 4000 MB Drive.

A second trip may possibly be arranged to the biodiesel facility recently installed at the Goldner-Walsh Nursery over in Pontiac on Orchard Lake Road. (between) Woodward and Telegraph on the south side of the road about 15 minutes from campus).
Laboratory Exercises (4)

Lab one consists of a biodiesel transesterification process. Students will bring in a liter of vegetable oil of their choice and transform it chemically into a clean and renewable diesel fuel substitute that can be blended with normal diesel and used directly in any diesel engine.

Lab two will be for a biomass densification exercise. Students will bring in waste paper, or other waste biomass materials for use in a manual briquette press. Different blends of biomass materials will be tested for the quality of briquettes produced in this press.

Lab three will be the assembly and testing of a solar photovoltaic (PV) panel and direct current (DC) lighting system.

Lab four will be the conversion, fermentation, and distillation of ethyl alcohol from corn. This is the process used in the many corn ethanol plants across the country.

Projects (2)

There will be two energy projects assigned early in the semester. One will consist of an automobile fuel log with efficiency improvements. The second will be a team effort to conduct and document a residential home energy audit. Please refer to the course schedule & assignment page for more information.

Quizzes

A number of short quizzes (6-7) will be given throughout the semester to allow for both the student and instructor to continually monitor the comprehension of the course materials. Quizzes will be equal in point value to the comprehensive final. If the seventh quiz is reached before the end of the semester, your lowest quiz score will be dropped. Quizzes will be utilized in place of a mid semester exam.

Final Exam

The final exam will be based on material covered in class, quiz material, and in the required text. You should find the final (and quizzes) to be reasonably straightforward if you have understood the lecture material and have read and have understood the text and handouts. Strict adherence to Oakland University Academic Conduct is your responsibility.

No make-up exam will be given. Should you miss an exam for non-legitimate reasons, you will receive a grade of zero on the missed examination. If you miss an examination for a legitimate reason, we can negotiate. If you turn in written assignments late, there will be a grade penalty of 20% each day the assignment is late.
Grading
There will be several randomly collected homework assignments, one laboratory assignment, two independent study projects, six or seven quizzes, and a comprehensive final exam. A small component of the grade based on attendance to the two field trips as well.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiesel lab #1</td>
<td>15</td>
</tr>
<tr>
<td>Biomass densification lab #2</td>
<td>15</td>
</tr>
<tr>
<td>Solar PV lab #3</td>
<td>15</td>
</tr>
<tr>
<td>Corn ethanol lab #4</td>
<td>15</td>
</tr>
<tr>
<td>Auto efficiency project #1</td>
<td>20</td>
</tr>
<tr>
<td>Home energy audit project #2</td>
<td>30</td>
</tr>
<tr>
<td>Six quizzes</td>
<td>90     (15 each)</td>
</tr>
<tr>
<td>Final exam</td>
<td>100</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>300</strong></td>
</tr>
</tbody>
</table>

The maximum number of points that any student can accumulate towards the final grade will be 300.

Grading will be using a sliding curve scale.

Worst case: scores that are 95% or higher will receive a grade of 4.0. Point totals between 75% and 95% will receive grades between 3.0 and 3.9. Between 60% and 74%, grades between 2.0 and 2.9. Between 45% and 59%, grades between 1.0 and 1.9.

Project and lab reports will be graded on the basis of the science and environmental content of the work as well as on the quality of the writing, including spelling, grammar, punctuation, etc.

Class Attendance
It is imperative that you avoid missing classes. We will be covering a vast number of topics and materials across the fields of energy resources, engineering, alternative energies, air pollution, and the science of climate changes. All of the content covered in class or in the assigned readings is important, and any of it could be the subject of an exam question. Lectures will be used to focus and amplify selected text subjects, to provide examples and images, to discuss current events, and to answer questions.

While the course matter is very extensive in breadth, most subjects are not treated in detail, and the content is not particularly difficult. No special scientific background is assumed.
Cell Phones
Please be conscientious to the instructor and other students. Cell phones are to be turned off during class period. You may not leave the classroom to answer phone calls and return.

Academic Conduct
The University’s regulations that relate to academic misconduct will be fully enforced. I insist on seeing your own work. Any student suspected of cheating by copying on exams, changing answers on exams after they are scored, having another person take an exam, obtaining exam questions prior to the exam time, use of any previous student’s course work, plagiarism, obtaining undeserved points on group work, or by other means will be referred to the Academic Conduct Committee. Students found guilty of academic misconduct face suspension or permanent dismissal. OU subscribes to a search service for identification of plagiarized material (TurnItIn.com). You will be required to submit your written assignments to this service. Anyone found by the Academic Conduct Committee to be guilty of misconduct will also receive a 0.0 grade for the course from the instructor in addition to whatever sanction(s) the Committee decides.

Special Considerations
Students who may require special considerations should work with Disabilities Support Services and the instructor to arrange accommodation.