PHYS 162          Solar and Alternative Energies   Winter 2015

Class times: Tuesday, Thursday 2:00-3:50 PM     Location: 110 WIL

Instructor: Miriam Deutsch.  Office: 275 WIL  Tel: 6-5973    Email: miriamd@uoregon.edu
Office hours: Monday 3-4 pm, Friday 2-3pm, or by appointment.

TA: David Grych  Office: WIL 262    Email: dgrych@uoregon.edu
Office hours: Tuesday 12:30-1:30pm, Wednesday 11am-12pm, or by appointment

TA: Chris Newby Office: WIL 463 Email: cnewby@uoregon.edu
Office hours: Thursday 11am-12pm, or by appointment.

You may also get help from any Physics GTF at the Physics Drop-in Center, located in 147 WIL. Check schedule posted on the door for hours.

Attendance policy: Attendance is not required, nevertheless strongly recommended. Lectures will cover materials which are mostly in the textbook, but will often address different approaches to solving problems, expand on examples in the text and solve problems not necessarily from your book.

Course text: The required text is Energy, Environment and Climate by R. Wolfson (second ed.)

Course outline:

We've embarked on the beginning of the last days of the age of oil. Embrace the future and recognize the growing demand for a wide range of fuels or ignore reality and slowly – but surely – be left behind.

-Mike Bowlin, chairman and CEO of ARCO (now BP), speech in Houston, 9 Feb 1999

This quotation practically says it all. Earth’s fossil fuel reserves are limited, and will eventually be depleted. Furthermore, experts unanimously agree that the rapid increase in use of fossil fuels over the past two centuries has led to an accelerated rate of global climate change, with the tipping point for catastrophic outcomes not yet known (or have we passed it…?)

This course aims to introduce you to the basic concepts and terms associated with energy and its various sources. We will cover the following topics:

- Energy – definition, fundamental concepts and uses
- Fossil fuels as an example of an “optimal” energy source
- Solar energy – a bottomless renewable energy source
- Other renewable energy sources – hydropower, wind, earth, biomass
- Nuclear energy – clean but risky
- Hydrogen – the other bottomless energy source

Homework: Reading assignments will be posted weekly. Assessment quizzes will be posted on Blackboard for you to take before the lectures (more on this below.) Homework will be assigned weekly and will usually be due the following week.

Homework submission: Completed assignments should be placed in the drop-box labeled “PHY 162” located in the west end of the Willamette Hall basement. This is the only acceptable mode for submitting homework. You should not email your completed assignment to either me or the TAs, unless specifically instructed to do so. Assignments sent by email will not be graded and will be marked as missed. Completed
Assignments should not be submitted through Blackboard. Assignments submitted through Blackboard will not be graded and will be marked as missed.

Late submission policy: Homework submitted up to 24 hours late will not be graded and will only be marked as submitted, automatically receiving 20% of the full credit. Homework submitted later than that will not be graded and will receive a grade of 0 points, as if not submitted. Submission deadlines will be strictly enforced. Please read each HW assignment carefully as submission due dates may vary. Special circumstances and/or emergencies may be accommodated on a case-by-case basis. In such cases you should contact me as soon as possible to discuss your specific needs. Do not assume you will receive a deadline extension without discussing the matter first with me.

Solutions to Homework: Solutions to some homework problems will be posted on Blackboard. It is important you review them, as they will hold additional information to what we do in class. I also like to reuse some homework problems in exams, and the solutions will often serve as study guides.

Course web site: http://blackboard.uoregon.edu/ I will post quizzes and homework assignments, course announcements, lecture slides and more. All posted materials may be found in appropriately named folders (e.g. “HW Assignments”). Announcements will appear on the main course page.

Exams and grade determination: Exam and grade breakdown are as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Scheduled for</th>
<th>% Weight of final grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exam</td>
<td>Feb. 3</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Mar. 16, 12:30 pm</td>
<td>30%</td>
</tr>
<tr>
<td>Homework</td>
<td>Weekly</td>
<td>40%</td>
</tr>
<tr>
<td>Reading Assessment Quizzes</td>
<td>Weekly</td>
<td>10%</td>
</tr>
</tbody>
</table>

The use of personal dictionaries or translators, electronic or in book form is not allowed during exams. The only electronic devices which may be used during exams are scientific calculators. This means that you will not be allowed to use your smart phone, tablet or laptop computer, as well as any other wireless enabled device during exams.

Reading Assessment Quizzes: Completing the reading assessment quizzes posted on Blackboard will ensure that you have done the required reading. Reading assignments will be posted weekly on Blackboard, along with related reading assessment quizzes. You will need to read the instructions carefully before beginning each quiz. The quizzes will be posted only for a limited time, so you should plan on taking them during the week of the related assigned reading. It will not be possible to make up a missed reading quiz.

Your final grade in the course will be determined as follows:

<table>
<thead>
<tr>
<th>Final score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>86-100</td>
<td>A</td>
</tr>
<tr>
<td>71-85</td>
<td>B</td>
</tr>
<tr>
<td>56-70</td>
<td>C</td>
</tr>
<tr>
<td>40-55</td>
<td>D</td>
</tr>
<tr>
<td>Below 40</td>
<td>F</td>
</tr>
</tbody>
</table>

The broad number ranges will allow room for +/- grades. If I find it necessary, I will curve the grades. Note: The highest grade of any standard curve will be A. I reserve the grade of A+ only to special cases, when a student’s performance is clearly above the norm. In statistics such cases are known as outliers. Hence an average score of 95% does not automatically guarantee you a final grade of A+.

Tip for doing well in this class: DO ALL YOUR HOMEWORK. There are two reasons this will help you succeed. The first is simple – homework assignments count for 40% of your final grade. The better you do on them the higher your final grade will be. The second lies in my tendency to regularly borrow from
homework problems when I write my exams. Many of the homework exercises will address core problems in energy science. Practicing those will help you stay on track and avoid major surprises on the exams.

**Professionalism:** A scholar takes care with his or her learning and the products of his or her efforts. This pertains to all aspects of the work, including attention to written and oral directions, proofreading, spelling, turning off cell phones before class, etc. Additionally, students are responsible for completing their own work. Plagiarism (submitting someone else’s work and claiming it to be your own) will not be tolerated.

**Diversity:** Open inquiry, freedom of expression, and respect for difference are fundamental to a comprehensive and dynamic education. I am committed to upholding these ideals by encouraging the exploration, engagement, and expression of divergent perspectives and diverse identities.

**Academic Integrity:** All students are expected to complete assignments in a manner consistent with academic integrity. Students must produce their own work and properly acknowledge and document all sources (ideas, quotations, paraphrases). Students can find more complete information about the University of Oregon’s Policy on Academic Dishonesty in the University of Oregon *Student Handbook*.

**Students with Disabilities:** The University of Oregon is working to create inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your participation, please notify me as soon as possible. You are also encouraged to contact the Accessible Education Center (formerly Disability Services) in 164 Oregon Hall at (541) 346-1155 or uoaecc@uoregon.edu. If you are not a student with a documented disability, but you would like for me to know about class issues that will impact your ability to learn, I encourage you to come visit during office hours so that we can strategize how you can get the most out of this course.

**Discrimination and Sexual Harassment:** The UO is committed to providing an environment free of all forms of prohibited discrimination and sexual harassment, including sexual assault, domestic and dating violence and gender-based stalking. Any UO employee, myself included, who becomes aware that such behavior is occurring has a duty to report that information to their supervisor or the Office of Affirmative Action and Equal Opportunity (http://aaeo.uoregon.edu/). The University Health Center and University Counseling and Testing Center (http://counseling.uoregon.edu/) can provide assistance and have a greater ability to work confidentially with students.