

Prof. Raghuv​eer Parthasarathy
 Dept. of Physics; Univ. of Oregon
 Winter 2010

Physics 162 – Physics of Solar and Renewable Energies

SYLLABUS

INSTRUCTOR	Professor Raghuv​eer Parthasarathy (Par -tha-sa-ra-thī) Office: 174 Willamette Hall Email: raghu@uoregon.edu
LECTURES	Tu Th 8.30-9.50am, 100 Willamette Hall <i>Attendance is not required, but is strongly recommended. Note that there is a “clicker-based” participation grade – see the Grading section, below.</i>
OFFICE HOURS	174 Willamette; Tu 1:30-2:30 & Th 10:00-11:00, or by appointment. <i>You’re strongly encouraged to come to office hours, either with specific course-related questions, or just to chat about physics, science, and other general topics.</i> Email: You can certainly ask questions by email. I’ll do my best to reply promptly (as long as your email doesn’t begin “Hey...”).
TEACHING ASSISTANTS (GTFs)	<u>Matt Briel</u> – office hours W 12:00-1:00pm & Th 1:00-2:00pm, Willamette 216. <u>Billy Scannel (0.5x)</u> – office hours <i>TBA</i> (see Web site). <i>Also note:</i> GTF's regularly staff room 147 Willamette (at the East side of the atrium.) to help students in physics classes. A schedule is posted on the door.
COURSE WEB SITE:	http://physics.uoregon.edu/~raghu/Physics162Winter2010.html We <i>might</i> use Blackboard for “clicker” registration and other administrative things. I will not post course documents there.
TEXTBOOK	<i>Energy, Environment, and Climate</i> by Richard Wolfson. The text is required.

TOPICS AND AIMS

Modern civilization uses vast amounts of energy in forms that are unsustainable and environmentally damaging. What are our alternatives? Can they meet our needs?

We’ll explore these issues, and will do so *quantitatively*, investigating the physics behind various energy sources. Why? It’s easy to have good intentions about energy and the environment, but without quantitative analysis, good intentions alone are insufficient for guiding important decisions and can often do real harm.

Who are you? By enrolling in this course, I’m assuming it’s likely that you care about energy issues. By being university students, I’m assuming that you’ll be the decision-makers of the future – businesspeople, policy makers, or at least voters – who will be faced with complex choices having to do with energy and society.

We’ll examine a variety of topics:

1. Present energy usage and sources
2. Energy: What is it?

3. Fossil Fuels and their Environmental Impacts, including Climate Change (Brief*)
 4. Solar energy
 5. Wind, wave, and geothermal energy sources
 6. Biomass
 7. Energy storage
 8. Energy conservation
- * Fossil fuels and Climate Change are discussed at length in **Physics 161** (Energy and the Environment), which will be offered in Spring 2010. Physics 161 **is not** a prerequisite for 162.
- Other goals: We will develop our abilities to think critically about scientific issues.

LAPTOPS IN CLASS

The use of laptop computers in class is not allowed. Why? Several studies, plus past experience, show that students using laptops in class spend a great deal of time on non-class-related activities (surfing the web, playing games, ...) and that these distractions negatively impact both learning and grades. This alone isn't a reason to ban laptops – you're responsible for your own performance in class. *In addition*, however, studies have shown that non-class-related laptop use distracts and impacts the learning of *other students nearby*. (E.g. Fried, C. B. *Computers & Education* **50**, 906-914 (2008).) Plus, *students* have complained to me about the environment created by their classmates laptop use.

Taking notes by hand, by the way, is more effective in cementing concepts in your mind. (Note, by the way, that lecture slides are posted on-line, so you don't have to frantically transcribe everything anyway.)

In summary, laptops are not allowed in class. The only exceptions will be for people with documented medical needs; please see me if this is the case.

COMPUTERS	Some assignments will involve finding and analyzing real-world data. You should be reasonably adept at navigating the internet and making simple graphs.
GRADING	Grade Components Clicker Participation – 7 %; Homework – 18%; Quiz – 10% Midterm Exam – 25 %; Final Exam – 40 % Scores will be weighted as shown above and added to determine a course score. The mapping between this score and the letter grade will be curved, based on my assessment of the class' performance. Final exam: Friday Mar. 19, 8-10am. Any missed exams require a doctor's note discussing the reason for the absence. Please see me beforehand for known exam scheduling conflicts. The grading scale for this course is given below. If the final class average is too low, I may apply a curve for a higher average final grade. (If the average is high, I'll be very happy; I won't adjust grades downward.) 86-100=A; 70-85.9=B; 56-69.9=C; 30-55.9=D; <30=F
HOMEWORK	There will be problem sets approximately every week. Feel free to chat with others about the problems, but of course, <i>the work you submit should be your own.</i>

	Many students find it helpful to discuss the setup or concepts behind problems with classmates or the GTFs, and then tackle the details themselves. You may hand the assignments in at the start of lecture or place them in a drop box (location to be determined). <u>No late homework will be accepted.</u> Solutions to the problem sets will be posted – study these. <i>Homework grading:</i> (1) Each student’s lowest homework grade will be dropped from the overall score. (2) Unless otherwise noted on particular assignments: Due to the large size of the class, we will not be carefully reading and commenting on all the assigned problems. We will pick one problem to grade carefully, for 50% of the score; the remaining problems will simply be checked for completeness, for the other 50% of the score. (We will not announce which problem will be closely graded.) Because of this it is especially important to study the problem set solutions.
HOW TO DO WELL IN THE COURSE	• Attend class. • Do the homework, and study the solutions. • Work on understanding all the concepts and example questions discussed in the lectures and the homework. “Understanding” does <i>not</i> mean “it sounds like it makes sense to me,” but more deeply, “I could explain this concept to one of my classmates.” • Come to my or the GTFs’ office hours with questions! • <i>Another suggestion: Sleep! Numerous studies show that sleeping helps both memory and understanding.</i>
STUDENTS WITH DISABILITIES	If there are aspects of the instruction or design of this course that result in barriers to your inclusion, please notify me as soon as possible. You are also welcome to contact Disability Services in 164 Oregon Hall, 346-1155.