Class: 132-04, MWF 11:10-noon
Instructor: Dr. Jonathan Fernsler
Instructor page: http://www.calpoly.edu/~jfernsle
Office Hours: T 3:10-4pm, W 1:10-2pm (Learning Center in 180-272), W 2–4pm, R 1:10-2pm in my office except as noted. Feel free to stop by if I’m busy we’ll schedule another time. I may be in my lab in 180-530.

Text and Materials (available at bookstore and elsewhere)

- *Physics for Scientists and Engineers* by Randall D. Knight (Pearson Addison-Wesley, 3rd Edition)
- *LON-CAPA* for online homework (online). The website is http://loncapa.calpoly.edu
- Spiral bound notebook for homework
- Scientific calculator (trigonometric functions, scientific notation, etc.)

Course goals:

- That many dynamic systems describe simple harmonic motion when displaced from equilibrium.
- That wave propagation depends on the nature of the medium.
- That the wave velocity is distinct from the velocity of the medium through which the wave travels.
- The law of refraction of light and how images can be formed by both mirrors and lenses.
- The workings of some simple optical instruments such as the magnifier, the microscope, the telescope and corrective eyeglasses.
- The wave nature of light, which leads to interference and diffraction effects.
- The definition of absolute temperature through the constant volume gas thermometer.
- To convert between the various temperature scales such as Kelvin, Celsius and Fahrenheit.
- The thermodynamic definition of the work done by a system.
- How to apply the first law of thermodynamics to thermal processes.
- To realize that engines that convert heat into mechanical work are inherently inefficient because of the restrictions of the second law of thermodynamics.
- To calculate the optimum efficiency of an engine working between two well-defined temperatures.

Class time and assignments: There will be little lecturing so your main source of information is the text. You are to read the appropriate sections in the textbook and work the examples prior to each class meeting. During class time there will be interactive demonstrations, and individual/group work focusing on conceptual exercises, problem solving, laboratory, and other activities. Regular class attendance is expected!!

Groups: You will be assigned to specific groups during the quarter. Please sit with your group in the room and work together to complete exercises and other activities.

GRADING (approximate letter grades and percentages for each category)

<table>
<thead>
<tr>
<th>Homework</th>
<th>Quizzes</th>
<th>In-class Exams (lower counts less)</th>
<th>Final Exam</th>
<th>Laboratory (see note)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 %</td>
<td>10 %</td>
<td>15 % + 20 %</td>
<td>25%</td>
<td>15 %</td>
<td>100%</td>
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Homework: Homework will be done on-line using the LON-CAPA system. Some of the online problems will have randomly generated numbers. It is helpful to solve problems symbolically, rather than immediately plugging numbers, so I can check your work if you have questions. Computers can be frustrating. Don’t let them be. Spend a reasonable amount of time. If things are not working, send me an email. We can clean up the details later.

Quizzes: There will be quiz each week, except when there is an exam. The quizzes will be conceptual in nature and will require explanations. There will be limited time for the quiz, ten minutes at most. Come prepared to write.

In-class Exams: There will be two exams during class period, expected dates are: Fri. Oct. 14 (Chaps 14, 20, 21) and Wed. Nov. 9 (Chaps 22-24). Exams will be closed book but you will be supplied with a formula sheet.

Final exam: The final exam is Wednesday December 14, 10:10am-1pm. It will be cumulative with emphasis on Chaps 15-19. The final exam will be closed book/notes; however, you will be supplied with a formula sheet.

General Policies:

- I encourage you to work with other students (form groups?); however, you must do and turn in your own work.
  Late or messy work will receive less than full credit.
• If there is a problem (illness, car trouble, course conflict, game, performance, etc.) let me know as soon as possible and we might be able to make other arrangements.
• Check the appropriate university documents for details and deadlines concerning academic honesty, adding, dropping, grading, withdrawal, incomplete, etc.
• Unforeseen circumstances may necessitate changes in this information. Changes will be announced in class and posted on the course website.