My Learning Objectives for Course
1. To provide a broad background for the non-science student with energy.
2. To present an overview of the interplay between energy and the nation’s environment and economy.
3. To develop an awareness of energy usage by the student on a personal basis.
4. To investigate conservation measures both for each individual and for the nation.
5. To discuss present research in energy.

Hamline Plan Learning Objectives Disciplinary Breadth (F, H, N, S)
1. Demonstrate ability to use and reflect upon fundamental skills and approaches* of the given field/discipline.
   *perspectives, methods of inquiry, tools and terminology, theories, interpretive frameworks, technologies, assumption, and/or epistemologies.

Grades: Your term grade will be based on your performance on seven quizzes, laboratory, and either a term paper, short oral presentation, or a laboratory project. The relative proportion of your grade of each is as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Class Participation; attendance</td>
<td>10%</td>
</tr>
<tr>
<td>4 Tests</td>
<td>40%</td>
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<tr>
<td>Laboratory</td>
<td>25%</td>
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<tr>
<td>Short oral presentation, term paper, or laboratory project</td>
<td>10%</td>
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<tr>
<td>Final Exam</td>
<td>15%</td>
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The Grading Scale is established by the following standards:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Grade</th>
<th>Percentage</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>A+</td>
<td>90-100%</td>
<td>A</td>
<td>74-76%</td>
<td>C+</td>
</tr>
<tr>
<td>A-</td>
<td>70-73%</td>
<td>B+</td>
<td>67-69%</td>
<td>C-</td>
</tr>
<tr>
<td>B</td>
<td>64-66%</td>
<td>B-</td>
<td>60-63%</td>
<td>D+</td>
</tr>
<tr>
<td>D</td>
<td>Below 60%</td>
<td>F</td>
<td>Below 60%</td>
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Class Participation and Attendance
You will be getting credit for class attendance. Various other in-class activities will occasionally be done which will also provide class participation points. Please don’t be late for class.

Tests
Tests will be held approximately every third week or so. (Test 1 is scheduled for Thursday, February 23.) No calculators with data storage capability may be used. I do have a supply of 40 “basic” calculators which you can use. All tests will be closed book.

Laboratory
There are two sections of laboratory for this class. Section A1 (CRN 33162) is on Tuesdays from 1 to 3 PM; Section A2 (CRN 33163) is on Wednesdays from 1 to 3 PM. The laboratory is scheduled for room RS 106.

The tentative schedule includes a number of laboratories and perhaps some field trips. Laboratories include: Heat & Temperature, Power, Personal Energy Usage, Specific Heat Capacity, Heat loss measurements through Windows and Walls, and Energy Audit of a Building or Home. Participation in all field trips is expected should we have them.

Short Oral Presentation, Term Project, or Laboratory Project
You have an option for choosing any one of these for your remaining 15% credit for the course. However, please make a choice as to which of the three you prefer by Thursday, April 20.

The short oral presentation will be given before the class on an energy topic of special interest to you. The time of the presentation should not exceed 12 minutes with a short interlude of questions (and answers???) to follow. The presentations will be made most likely on Thursday, May 4 or May 11.

The term paper should be an energy topic of special interest to you. The length should be from 5 to 7 pages but should mainly be determined by how long it takes you to develop your topic. Include sources at end of paper and connect as best you can to class. Be sure to include direct references to your sources throughout your paper. There will also be a
"tough topic" component in grading. Use "legitimate" webpage resources. Term papers will be due no later than Thursday, May 11.

A laboratory project can also be performed. You may work on this project at home and/or in the physics laboratory during the afternoons. I shall be happy to try to answer your questions and to provide encouragement along the way, but you will propose the project, you will do the work, and you will write up the report on your project. Due date is also Thursday, May 11.

The proposal for the lab project and the topics or the short oral presentations and term papers should be approved (please!) by J. Artz no later than Thursday, April 27.

Office Hours, Peer Tutoring, and comments:
Office Hours: Tuesday & Wednesday: 3 – 4 PM; Thursday: 1 – 3 PM.
I shall try to be available immediately after class for questions.
Peer Tutoring: Sundays 6 to 8 PM with Opey, Thursdays 5 to 7 PM with Areeg and/or 7 to 9 PM with Elizabeth.
Opey and Elizabeth peer tutoring is in BUSH LIBRARY BASEMENT. Areeg in DSC 102 (QRC).
Comments: My Office: RS 126, email: jartz@hamline.edu and webpage: http://physics.hamline.edu/~jartz
Office Phone #651-523-2256.,
( NOTE: Tutoring and student help will be made available if requested.)

Laboratory Safety Statements:

Please exercise courtesy and common sense judgment when working in the physics laboratory, and remember:

If you are in doubt about any procedure, or if it may seem unsafe to you, then do not continue. Ask your instructor for help.

- Avoid leaving books, backpacks, and jackets in the middle of the floor when in the lab because we do not want anyone tripping and hurting themselves.
- Use caution when using sharp objects (razor blades or scissors). Whenever possible, move or point the cutting blade away from your body.
- Do not look directly into a laser. When using lasers, maintain a constant beam height over the table and do not bend so that your eyes are at optical bench level (remember that there are others in the room using other lasers and we do not want accidental entry of laser light into anyone’s eyes).
- Food and drink are not allowed into labs with radioactive materials.
- Please do not bring food and drink into the lab when there is any danger of damaging electrical or computer equipment.
- Always handle equipment with care. Equipment will occasionally break due to normal usage. Do what you can to help us lengthen the life of our equipment. If you think a piece of equipment is damaged, then please let the instructor know as soon as possible. We want to maintain all of our equipment in good working order.

Course Evaluations:
Student feedback is a vital element for review of class and faculty effectiveness. All students are expected to participate in the course evaluation process as administered by the university; course evaluation is considered to be a part of the curriculum of all courses. A small amount of credit will be given in this class upon documentation that you have completed all of your course evaluations.

And Finally:
IF YOU EVER HAVE CONCERNS, PROBLEMS, GRIPES, ETC. SEE ME, SEE ME, SEE ME! PLEASE DON'T EVEN THINK OF MISSING A SINGLE CLASS! THIS COURSE IS PACKED AND INTENSE with a wealth of material for life-long learning.
GOOD LUCK, WORK HARD, AND HAVE FUN! Jerry Artz