EML3007: Elements of Thermodynamics and Heat Transfer
Syllabus -- Fall 2011 -- Section 0200

(Modifications to this syllabus may be required during the semester. Any changes to the syllabus will be posted on the course website and announced in class.)

1. **Catalog Description**: Applications of first and second laws of thermodynamics to closed and open systems. Steady one-dimensional conduction, lumped parameter analysis, convection, radiation. Intended for non-mechanical engineering students. Credits: 3

2. **Pre-requisites**: CHM2045, MAC2313, and PHY2048

3. **Course Objectives**: This course provides an introduction level coverage of thermodynamics and heat transfer. The course stresses the fundamentals while emphasizing application problems of relevance to a wide range of engineering disciplines. Students will learn the first law and the second law of thermodynamics, the use of these laws in a variety of engineering applications, and fundamental modes of heat transfer (conduction, convection, and radiation).

4. **Contribution of course to meeting the professional component**: This course is designed for engineering disciplines whose students are more interested in using thermodynamics and heat transfer than becoming highly specialized in them. The course content is 100% engineering science.

5. **Relationship of course to program outcomes**: This course achieves the following ABET outcomes [note that the outcome number corresponds to the respective ABET outcomes (a) through (k)]: (a) Apply knowledge of mathematics, science, and engineering (high coverage, addressed by lectures and example problems, assessed by exams and homework) (e) Identify, formulate, and solve engineering problems

6. **Instructor**: Bruce Carroll, Ph. D.
   - Office location: 218 MAE-A
   - Telephone: 392-4943
   - E-mail address: bfc@ufl.edu
   - Web site: http://lss.at.ufl.edu (e-learning in sakai system)
   - Office hours: Tuesday and Thursday Noon to 1:30 pm
   - Teaching Assistants: TBD

7. **Meeting Times and Location**:
   - MWF6 (12:50 to 1:40) in MAEB 211

8. **Material and Supply Fees**: None

9. **Textbooks Required**: Fundamentals of Thermal-Fluid Sciences – UF Edition; by Cengel, Turner and Cimbala; McGraw Hill; 4th Edition. (Students may purchase the non-UF edition. The UF edition includes only a portion of the total number of chapters in the regular text and is available at a reduced cost.)

10. **Recommended Reading**: See schedule available at https://lss.at.ufl.edu/ (use Sakai system)

11. **Course Outline and Schedule**: See the detailed schedule available at https://lss.at.ufl.edu/ (use Sakai system)
   - Concepts (Chapters 1-2)
   - Properties, energy, & first law of thermodynamics (Chapters 3-6)
   - Second law of thermodynamics (Chapters 7-8)
   - Conduction (Chapters 17-18)
   - Convection (Chapters 19-20)
   - Radiation (Chapter 21)
11. **Attendance and Expectations**: Attendance is mandatory. Excused absences will be given for documented medical reasons, UF related travel or job interview travel. Documentation must be in the form of a doctor’s note, or letter from the sponsor of the travel. During class, cell phones must be turned off.

12. **Assessment Methods and Grading**: Homework is assigned in the course schedule. Homework will not be graded. Solutions will be posted online.

A “Practice Exam” or PE problem will be assigned each week with a hard copy turned in during class. The PE problems may be downloaded from the course web site [https://lss.at.ufl.edu/](https://lss.at.ufl.edu/) (use Sakai system).

There will be three exams and a final exam. All exams will be cumulative but will emphasize the most recently covered material. The exams will be during the regular class period. See the course schedule for exam dates.

The relative weighting of the PE Problems and Exams will be:

a. PE Problems 20%

b. Exams 80%

Each exam and the final exam will have two (2) problems each for eight (8) total exam problems. Your lowest score on an exam problem will be dropped with your exam grade being based on the other seven (7) problems.

PE problems must be turned in at the start of class. Late assignments will not be accepted. The lowest grade for the PE problems will be dropped.

If a student feels that an exam or homework is graded unfairly, or if there is an error in the grading, it should be brought to the attention of the instructor within two weeks after the graded material is handed back. Scores will not be reconsidered beyond the two week period.

13. **Grading Scale**:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>93 – 100: A</td>
<td>87 – 89.9: B+</td>
</tr>
<tr>
<td>90 – 92.9: A-</td>
<td>77 – 79.9: C+</td>
</tr>
<tr>
<td>80 – 82.9: B-</td>
<td>67 – 69.9: D+</td>
</tr>
<tr>
<td>70 – 72.9: C-</td>
<td>0 – 59.9: E</td>
</tr>
</tbody>
</table>

14. **Make-up Policy**: No late assignments will be accepted. Makeup exams are not normally allowed. If you cannot attend an exam, you must contact the instructor prior to the exam. Arrangements will be made for students on a case by case basis. (Failure to contact the instructor prior to the exam will result in a zero on that exam.)

15. **Honesty Policy and Ethical Considerations**: All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others. Additional information is available on the class web site.

16. **Accommodation for Students with Disabilities**: Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

17. **UF Counseling Services**: Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.

18. **Software Use**: All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.
Notes on Homework and Practice Exam Problems

Policies/Procedures:

1. Homework (HW) problems are an essential element of this course. In general, students can expect to have HW assigned each class period. See the e-learning site and schedule for HW assignments. HW will not be graded, but solutions will be posted on the course web site for you to check your own work.
2. The PE problems may be downloaded from the course web site. They will be posted approximately weekly.
3. Due dates for Practice Exam (PE) problems are posted in the course schedule.
4. The PE problems are submitted in class and must follow the format given below. Points will be deducted for failure to follow the prescribed format.
5. Graded PE problems will be given back to you in class. Solutions will be posted on the e-learning site.

   6. **Students are encouraged to discuss the general principles involved in the homework sets with one another, but the detailed solution of each problem should be completed individually. Submitting a PE solution that is directly copied from another source is considered a violation of the honesty policy.**

Format for PE Problems

1. Use 8.5" x 11" paper and write on one side only using a pencil. Write down your name and sorting number on every page.
2. Start each problem on a new page.
3. Each PE problem must be completed in a format consisting of the following components:

   **Given:** Summarize the problem statement clearly indicating what information is given and define appropriate variables.

   **Required:** List information and results required or asked for in the problem.

   **Diagram:** Draw a diagram of the physical problem to be considered. Include coordinate axes when appropriate, and label relevant dimensions and parameters. Diagrams may include plots, schematics, etc.

   **Assumptions:** Provide the appropriate assumptions and mathematical formulation for the basic laws that you consider necessary to solve the problem.

   **Analysis:** Provide full details of the analysis in a logical manner. Develop the analysis as far as possible before substituting numerical values. If possible, give the answer algebraically before computing the final numerical result.

   **Final Answer:** Clearly indicate your final answer by putting a box around the answer.

This format is designed to help guide you through the problems and will help you approach problems for which you cannot see an immediate solution. **Points will be deducted for failure to follow the required format!!**