Course Syllabus

Course Information – Spring 2013

MECH 3310.001
Thermodynamics
Room: JO. 4.102
Time: MW 5:30 – 6:45 AM
Final: Project due May 1 in class (presentation) and Mon. May 6, 11:55 p.m. (written)

Professor Contact Information

Prof. Walter Voit
Office: NSERL 4.710
Phone: 972.883.5788
Email: walter.voit@utdallas.edu (preferred method of contact)
Office Hours:
By appointment (set up via email)
Or when my office door is open

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisite: MECH 3300

Course Description

MECH 3310 Thermodynamics (3 semester hours) Lecture course. This course focuses on availability and reversible work, machine, and cycle processes; real gas behavior; non-reactive gas mixtures; reactive mixtures; and thermodynamics of compressible fluid flow.

Learning Objectives/Outcomes

It is expected that you will gain a fundamental physical and mathematical understanding of thermodynamics rather than memorizing the equations and specific problems. By this, it is implied that you will be able to correctly apply the course content (given in an outline below) to new situations so as to evaluate potential industrial applications through both physical induction and mathematical analysis/computation. Such inductive and analytical reasoning will be taught through classroom examples and homework, and tested on examinations.

1 Getting Started: Introductory Concepts and Definitions
2 Energy and the First Law of Thermodynamics
3 Evaluating Properties
Evaluating Properties: General Considerations
Evaluating Properties Using the Ideal Gas Model
4 Control Volume Analysis Using Energy
5 The Second Law of Thermodynamics
6 Using Entropy
7 Exergy Analysis (skip)
8 Vapor Power Systems
9 Gas Power Systems --Internal Combustion Engines
10 Refrigeration and Heat Pump Systems
11 Thermodynamic Relations

Required Textbooks and Materials

Fundamentals of Engineering Thermodynamics by Moran, Shapiro (6th ed)

Suggested Course Materials

Will be discussed as appropriate

Assignments & Academic Calendar

(Topics, Reading Assignments, Due Dates, Exam Dates)

Grading Policy

Choose 4 of First 5 Tests

Test 1 (Ch.1 – Ch. 3.11)	20%	Wed. Jan. 30
Test 2 (Ch. 3.12 – Ch. 4)	20%	Mon. Feb. 18
Test 3 (Ch. 5, Ch. 6, Ch. 11)	20%	Wed. March 6
Test 4 (Ch.8, Ch. 9)	20%	Wed. April 3
Test 5 (Ch. 10, Ch. 11)	20%	Wed. April 24

Final Project (Handed out Tues. March 20)	20%	Due May 3, 4
Homework*	25% toward each test	Due as assigned

**Homework is optional. Homework handed in after the due date will not be counted. All homework before each test can count up to 25% towards that specific test grade. Example 1 - If you score an 80 on your first test, and received a 100 average on the homework turned in before that test, your new test score will be 80*(3/4) + 100*(1/4) = 85.*

Example 2 – If you score a 95 on your first test, and received a 93 average on all homework, you will still receive a 95 for that test, because doing the homework cannot hurt your grade.

Example 3 – You choose not to do homework. Your test grade will be what you earn. Homework will be averaged separately between each test and the next.

(This means that homework must be handed-in before class)

Course & Instructor Policies

(make-up exams, extra credit, late work, special assignments, class attendance, classroom citizenship, etc.)

You must have a certified (doctor or otherwise) excuse for missing a test date. I am willing to work with you for university sanctioned travel or in other circumstances at least one week BEFORE the test date.

Off-campus Instruction and Course Activities

Below is a description of any travel and/or risk-related activity associated with this course.

None anticipated

Policies and Procedures for Students

The University of Texas at Dallas provides a number of policies and procedures designed to provide students with a safe and supportive learning environment. Brief summaries of the policies and procedures are

provided for you at http://provost.utdallas.edu/home/index.php/syllabus-policies-and-procedures-text and include information about technical support, field trip policies, off-campus activities, student conduct and discipline, academic integrity, copyright infringement, email use, withdrawal from class, student grievance procedures, incomplete grades, access to Disability Services, and religious holy days. You may also seek further information at these websites:

- http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm
- http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html
- http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm
- http://www.utdallas.edu/disability/documentation/index.html

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These descriptions and timelines are subject to change at the discretion of the Professor.

Assignments & Academic Calendar
(Topics, Reading Assignments, Due Dates, Exam Dates)

1. Mon. Jan. 14 – Intro Syllabus, Course Planning, Chapter 1 – highpoints
2. Wed. Jan. 16 – Ch. 2
3. Mon. Jan 21 – Martin Luther King Day – **NO CLASSES**
4. Wed. Jan 23 – Ch. 3, Elements of Ch. 6, Ch. 11
5. Mon. Jan. 28 – Ch. 3, Elements of Ch. 6, Ch. 11 + Test Review
6. Wed. Jan. 30 – **Test #1**
7. Mon Feb. 4 – Ch. 3 (ideal gas)
8. Wed. Feb. 6 - Ch. 4
9. Mon. Feb. 11 – Ch. 4
10. Wed. Feb. 13 – Ch. 4 + Test Review
11. Mon. Feb. 18 – **Test #2 -** Conference in Washington, D.C.
12. Wed. Feb. 20 – Ch. 5
13. Mon. Feb, 25 – Ch. 5
14. Wed. Feb. 27 – Ch. 6
15. Mon. March 4 –Ch. 6 + Test Review – Conference in San Antonio
16. Wed. March 6 – **Test #3** – Conference in San Antonio
17. Mon. March 11 – **Spring Break** – **NO CLASSES**
18. Wed. March 13 – **Spring Break** – **NO CLASSES**
19. Mon. March 18 – (Sections Ch. 11) Final Project Preparation
20. Wed. March 20 – Ch. 8
21. Mon. March 25 – Ch. 8
22. Wed. March 27 – Ch. 9
23. Mon. April 1 – Ch. 9 + Test Review –Conference in San Francisco
24. Wed. April 3 – **Test #4** –Conference in San Francisco
25. Mon. April 8 – Ch. 10
26. Wed. April 10 – Ch. 10
27. Mon. April 15 – Ch. 11
28. Wed. April 17 – Ch. 11
29. Mon. April 22 – Project Day + Test Review
30. Wed. April 24 – **Test #5**
31. Mon. April 29 – Project Day
32. Wed. May 1 – **In class presentations** (Last Day of Classes)
33. Mon. May 6 – eLearning by 11:55 p.m. (**Final Written Project Due**)