MAE 3311 THERMODYNAMICS II
SPRING 2007
MWF 11:00AM-11:50AM AT GS104

INSTRUCTOR

Bumsoo Han, Ph.D., Assistant Professor
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Office Hours: MW 1:00pm-2:30pm or by appointment

COURSE DESCRIPTION

Power and refrigeration cycles, property relations and equations of state, ideal gas mixtures, mixtures of gases and vapors, combustion stoichiometry, and thermodynamics of combustion.

COURSE OBJECTIVES

1. Knowledge on thermal engineering systems for power generation and refrigeration
2. Apply the 1st and 2nd laws of thermodynamics to design and analysis of thermal systems
3. Learn how to model, formulate, solve and analyze thermal processes/systems

STUDENT'S LEARNING OUTCOMES

1. Ability to design thermal engineering systems and components to meet desired needs
2. Ability to apply knowledge of math, science and engineering to thermal applications
3. Ability to identify, formulate and solve engineering problems

TEXTBOOK

Thermodynamics: An Engineering Approach (5th Edition)
by Yunus A. Cengel and Michael A. Boles

PREREQUISITES CHEM 1441; MAE 3310, 3360, 2314 or concurrent enrollment.

CLASS SCHEDULE

Weeks	Topics	Assignments & Exams
Week 1	Review of MAE3310	
Week 2	Gas power generation cycles - Reciprocating engines	HW#1
Week 3	Gas power generation cycles - Brayton cycle	
Week 4	Gas power generation cycles - Improvements and propulsion	HW#2 & Quiz#1
Week 5	Vapor power generation cycles - Rankine cycle	
Week 6	Vapor power generation cycles - Improvements	HW#3
Week 7	Refrigeration cycles - Vapor-compression cycle	
Week 8	Refrigeration cycles - Heat pump and improvements	HW#4 & Quiz#2
Week 9	Thermodynamic property relations - Maxwell relations	
Week 10	Thermodynamic property relations - General relations	Design Project
Week 11	Gas Mixture	
Week 12	Air-conditioning (Gas-vapor mixture)	HW#5 & Quiz#3
Week 13	Chemical reactions- Combustion and enthalpy of formation	
Week 14	Chemical reactions- First law & adiabatic flame temperature	HW#6 & Quiz#4
Week 15	Semester Summary	

GRADING

6 Homework Assignments (4 regular + 2 key assignments)	4×5% + 2×7.5%	= 35%
1 Design Project (key assignment)	1×10%	= 10%
4 Quizzes	4×7.5%	= 30%
Final Exam		= 25%

Course grading will be based on the following scale:
A (100-90%), B (89-80%), C (79-70%), D (69-60%) and F (below 59%)

COURSE REQUIREMENTS

1. Attendance - Students are expected to be on time, attend class sessions, complete reading assignments and be prepared to participate in class discussions. If a student misses a class, it is his/her responsibility to make up the missed class (i.e. get the course notes, assignments or announcement from other students).

2. Homework assignments - Students should submit their homework assignments by 5:00pm on due dates at the instructor's mailbox at WH211. **Late submission will not be graded.** The due dates will be announced during the class.

3. Key Assignments - This course specifically assesses – *1) your ability to design a system, component, or process to meet desired needs; 2) your ability to identify, formulate, and solve engineering problems; and 3) your ability to use the techniques, skills and modern engineering tools necessary for engineering practice.* Therefore, certain related assignments (key assignments) in this course must be passed in order to pass the course. In order to pass this class you must pass all key assignments. If any key assignment is not passed, you will not pass the class even if you score perfectly on all exams and other assignments. The key assignments are

- Design Project: Design a power generation cycle using modern engineering tools
- HW #2 & # 4: Model, formulate and analyze thermal systems

Tardy key assignments will be accepted till 05/04 for class passing purposes, but will not be scored.

4. Exams - There will be three quizzes and a final exam given during this course. You must take all tests at their scheduled times. There will be no make-up examinations.

5. Course website - Course website is available at http://www-woolf.uta.edu/. The login is "mae3311" and the password is "90thermo74".

6. Academic honesty - It is the philosophy of the University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22).

7. Students with disability - If you need accommodations in compliance with the ADA, consult with the instructor.