Thermodynamics I (ME 398), Spring 2015

Department of Mechanical Engineering, Wichita State University

Instructor:	Dr. Gisuk Hwang
Office location/hours:	EB 101C, M/W 4:00pm – 5:30pm or by appointment
Email:	Gisuk.Hwang@wichita.edu
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Class schedule	Room HH 209, M/W 5:35 – 6:50 pm
Prerequisites:	MATH 243 (Calc II), PHYS 313 (Phys I), or by instructor permission
Grader:	Mr. Tadeh Avanessian (txavanessian@wichita.edu)

Textbook: *Fundamentals of Engineering Thermodynamics*, 7th Ed., Wiley, by Moran, Shapiro, Boettner, and Bailey

References: *Fundamentals of Thermodynamics*, Wiley, 8th Ed., 2012, and *Thermodynamics* 6th Ed., Wark, McGraw-Hill, 2001

Course Description: the laws of thermodynamics including properties of substances and phase equilibrium, the first and second laws of thermodynamics, entropy, power cycles, refrigeration cycles, and chemical and phase equilibrium.

Objectives:

To gain an understanding of heat, work, and the first and second laws of thermodynamics

To apply the above concepts to simple processes, including phase changes, control mass and control volume processes

Grading:

Weekly Quiz	20%
Midterm exam I	25%
Midterm exam II	25%
Final exam	30%

Grading scale:

A: 100-95, A-: 94-90, B+: 89-85, B: 84-80, B-: 79-75, C+: 74-70, C: 69-65, C-: 64-60, D+: 59-55, D: 54-50, D-: 49-45

F: < 45.

Exam format:

Two midterm exams will have three problems for each, and final exam will have four problems. Hardcopy cheating sheets will be given. Calculator is allowed. Use of other electronic devices such as cell phone, laptop, and tablet PCs is strictly prohibited.

Quiz format:

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Class Schedule

Week	Date	Subject	Reading
1	1/21	Introductions: overview and backgrounds	1.1-1.3
2	1/26	Unit and measuring properties	1.4-1.9
	1/28	Energy and work	2.1-2.3
3	2/2	Energy transfer by heat and first law of thermodynamics	2.4-2.5
	2/4	Energy analysis of cycles and energy storage	2.6-2.7
4	2/9	State properties: pressure, specific volume, and temperature	3.1-3.3
	2/11	Evaluating properties	3.4-3.5
5	2/16	Thermodynamics properties: enthalpy, and internal energy	3.6-3.8
	2/18	Review:1.1-3.8	1.1-3.8
6	2/23	In-class midterm exam I: Chap 1.1-3.8	1.1-3.8
	2/25	Thermodynamics properties: specific heats	3.9
7	3/2	Liquid and solid, generalized compressibility and ideal gas model	3.10-3.11
	3/4	Ideal gas model and polytropic process relation	3.12-3.15
8	3/9	Conservation of mass for a control volume	4.1
	3/11	Mass rate balance and conservation of energy	4.2-4.5
9	3/16	Spring break (no class)	-
	3/18	Spring break (no class)	-
10	3/23	Nozzles, diffusers, and turbines	4.6-4.7
	3/25	Compressors and pumps and he zles, diff 683.02 T:he 0.47998 ref 86.904 W*h 63.36n	