ECE309 THERMODYNAMICS & HEAT TRANSFER Spring 2016

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Textbook:	 Introduction to Thermodynamics and Heat Transfer, 2nd Edition Yunus A. Çengel, McGraw-Hill, 2008. (recommended) 					
	2) Property Tables Booklet (required)					
Supplementary Books:	1) Introduction to Thermal Systems Engineering, Moran, Shapiro, Munson and DeWitt, John Wiley and Sons Inc., New York, NY, 2003.					
	2) Fundamentals of Thermodynamics, 7th Edition, Sonntag, Borgnakke and Van Wylen, John Wiley and Sons Inc., New York, NY, 2009					
	3) Fundamentals Bergman and	of Heat and Lavine, John	Mass Transf n Wiley and S	er, 7th Edition, Incropera, DeWitt, Sons Inc., New York, NY, 2011		
Outline:	Chapter 2 Chapter 4 Chapter 3, 5, 6 Chapter 7, 8	 Introdution Propertian 1st Law 2nd Law 	uction and Ba ties of Pure S w of Thermoo w of Thermo	asic Concepts Substances lynamics dynamics & Entropy midterm		
	Chapter 10, 11 Chapter 12, 13, 14 Chapter 15	- Condu - Convec - Radiat	ction Heat Tr ction Heat Tr ion Heat Tra	ransfer ansfer nsfer final		
Web page:	http://www.mhtl	ab.uwaterloo	.ca/courses/e	ce309/index.html		
Tutorials:	T.A.'s will work through selected problems and answer questions about lecture material or assignments. They will also give individual help.					
Assessment:	Project Midterm Final	15% 40% 45%	alored bash	araminations of the source me		
	terial. However, you are permitted to use the <i>Property Tables Booklet</i> for Cengel plus a crib sheet consisting of <u>one side</u> of one $8 \ 1/2 \times 11$ sheet of paper for the midterm exam and <u>two sides</u> of one $8 \ 1/2 \times 11$ sheet of paper					

for the final exam.

Exams:	Midterm:	June 17, 2016; time TBD
		The midterm will be a 120 minute open book exam written during the 7th week of the term, based on material covered in Chapters 2-8
	Final	The final exam will be a 150 minute open book exam based on ma-
	I man.	The man exam will be a 100 millitle open book exam based on ma

terial covered in Chapters 10 - 15

Note: Because the midterm exam covers only the first half of the course and the final exam covers the second half of the course, the weighting scheme for the midterm and final exams are fixed and no alternative schemes are possible. It is important to give your full attention to the <u>entire</u> course if you want to achieve maximum success.

ECE309 Project

"Thermodynamics & Heat Transfer Analysis of a Compressed Air Car"

One project, combining both thermodynamics and heat transfer, will be assigned during the eighth week of the term. The project must be completed and then handed in during the twelfth week of the term, subject to the following conditions:

- The project must be completed individually.
- Anyone suspected of copying or cheating will be assigned a grade of zero.
- All projects must be handed in immediately following the lecture period on the Due Date.
- No extensions will be granted.
- Failure to hand the project in on time will result in a grade of zero for that project.

Schedule

Due Date: July 21, 2016

Grade: 15%

Week	Days	Topics	Text Sections
1	May 02 - 06	Basic concepts of thermodynamics - thermodynamic systems and properties	$2\text{-}1 \rightarrow 2\text{-}8$
2	May 09 - 13	Properties of pure substances - equations of state	$\begin{array}{c} 4\text{-}1 \rightarrow 4\text{-}7 \\ 5\text{-}3 \rightarrow 5\text{-}5 \end{array}$
3	May 16 - 20	First law of thermodynamics - control mass (closed systems)	$\begin{array}{c} 3\text{-}1 \rightarrow 3\text{-}7\\ 5\text{-}1, 5\text{-}2 \end{array}$
4	May 23 - 27	First law of thermodynamics - control volume (open systems)	$6-1 \rightarrow 6-5$
5	May 30 - June 03	Second law of thermodynamics	$\begin{array}{l} 7\text{-}1 \rightarrow 7\text{-}3 \\ 7\text{-}6 \rightarrow 7\text{-}10 \end{array}$
6	June 06 - 10	Entropy - control mass and control volume	$8-1 \rightarrow 8-10, 8-13$
midter	rm exam		June 17
8	June 20 - 24	Conduction heat transfer - steady state	$10-1 \rightarrow 10-6$
9	June 27 - July 01	Conduction heat transfer - transient	$11-1 \rightarrow 11-2$
10	July 04 - 08	Convection heat transfer - external forced convection - internal forced convection	$\begin{array}{c} 12\text{-}1 \rightarrow 12\text{-}8 \\ 13\text{-}1 \rightarrow 13\text{-}6 \end{array}$
11	July 11 - 15	Convection heat transfer - natural convection	$14-1 \rightarrow 14-4$
12	July 18 - 22	Radiation heat transfer - properties	$15-1 \rightarrow 15-4$
13	July 25 - 26	Radiation heat transfer - exchanged between surfaces	$15-5 \rightarrow 15-7$
final e	xam		August XX

ECE309 Course Schedule

ECE309 Recommended Problems

Weeks		Section	Problems
1	May 02 - 06	Chapter 2	2-53, 2-67, 2-85, 2-96
2	May 09 - 13	Chapter 4 & 5	4-41, 4-54, 4-58, 4-79, 4-95
3-4	May 16 - 27	Chapters 3, 5, & 6	$\begin{array}{l} 3\text{-}40,\ 3\text{-}54,\ 3\text{-}105,\ 5\text{-}8,\ 5\text{-}25,\ 5\text{-}29,\ 5\text{-}37\\ 5\text{-}40,\ 5\text{-}42,\ 5\text{-}63,\ 5\text{-}74,\ 5\text{-}84,\ 5\text{-}109,\ 6\text{-}44\\ 6\text{-}51,\ 6\text{-}60,\ 6\text{-}80,\ 6\text{-}94,\ 6\text{-}124,\ 6\text{-}168,\ 6\text{-}173\\ \end{array}$
5-6	May 30 - June 10	Chapters 7 & 8	7-88, 7-131, 7-135, 8-24, 8-44, 8-46, 8-60, 8-73, 8-99, 8-128, 8-132, 8-135, 8-148, 8-152, 8-166, 8-168, 8-189
8-9	June 20 - July 01	Chapters 10 & 11	10-20, 10-35, 10-49, 10-54, 10-59, 10-69, 10-71, 10-92, 10-126, 10-143, 10-157, 10-162 11-14, 11-17, 11-36, 11-41, 11-46, 11-97, 11-104
10-11	July 04 - 15	Chapters 12, 13, & 14	12-40, 12-49, 12-68, 12-70, 12-87, 12-98 13-39, 13-47, 13-59 14-18, 14-24, 14-45, 14-82
12-13	July 18 - 26	Chapter 15	15-27, 15-33, 15-50, 15-57, 15-77, 15-79 15-96, 15-107, 15-108

Web Access				
Name:	ece309			
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