SYDE 381
THERMODYNAMICS
Spring 2014

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Textbook: *1) Introduction to Thermodynamics and Heat Transfer, 2nd Edition*
Yunus A. Çengel, McGraw-Hill, 2008.

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 of Heat and Mass Transfer, 7th Edition*, Incropera, DeWitt, Bergman and Lavine, John Wiley and Sons Inc., New York, NY, 2011

Outline:

Chapter 2	-	Introduction to Thermodynamics
Chapter 4	-	Properties of Pure Substances
Chapter 3, 5, 6	-	1st Law of Thermodynamics
Chapter 7, 8	-	2nd Law of Thermodynamics & Entropy

midterm

Chapter 10, 11	-	Conduction Heat Transfer
Chapter 12, 13, 14	-	Convection Heat Transfer
Chapter 15	-	Radiation Heat Transfer

final

Web page: http://www.mhtlab.uwaterloo.ca/courses/syde381/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	10%
Tutorial Quiz (best 2 of 3)	5%
Midterm	40%
Final	45%

The tutorial quizzes, midterm and final exam are open book examinations of the course material, where ***only*** the recommended course textbook can be used during the examinations. It is your responsibility to make sure you bring your text book to these examinations since the property tables will be required to complete these exams.

Exams: Midterm: The midterm will be a 110 minute open book exam written during the 6th 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 material covered in Chapters 10 - 15

Tutorial Quiz: There will be 3 - 25 minute pop quizzes held within the tutorial time period throughout the term. The quizzes will be unannounced and there will not be an opportunity to make up missed quizzes if for some reason you are unable to attend the tutorial. Only the best 2 of the 3 quizzes will count in the final grade.

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 not alternative schemes are possible. It is important to give your full attention to the entire course if you want to achieve maximum success.

SYDE 381 Project

One project, combining both thermodynamics and heat transfer, will be assigned during the seventh week of the term. The project must be completed and then handed in during the eleventh 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

Project: Thermodynamics & Heat Transfer Analysis of a Compressed Air Car

Assigned Date: June 23, 2014

Due Date: July 23, 2014

Grade: 10%

SYDE 381 Course Schedule

Week	Days	Topics	Text Sections
1	May 05 - 09	Basic concepts of thermodynamics - thermodynamic systems and properties	2-1 → 2-8
2	May 12 - 16	Properties of pure substances - equations of state	4-1 → 4-7
3	May 20 - 23	First law of thermodynamics - control mass (closed systems)	3-1 → 3-6 5-1 → 5-5
4	May 26 - 30	First law of thermodynamics - control volume (open systems)	6-1 → 6-5
5	June 02 - 06	Second law of thermodynamics	7-1 → 7-3, 7-6 → 7-10
6	June 09 - 13	Entropy - control mass and control volume	8-1 → 8-13
midterm exam			**June ??**
7	June 16 - 20	Conduction heat transfer - steady state	10-1 → 10-6
8	June 23 - 27	Conduction heat transfer - transient	11-1 → 11-2
9	June 30 - July 4	Convection heat transfer - external forced convection - internal forced convection	 12-1 → 12-8 13-1 → 13-6
10	July 07 - 11	Convection heat transfer - natural convection	14-1 → 14-4
11	July 14 - 18	Radiation heat transfer - properties	15-1 → 15-4
12	July 21 - 25	Radiation heat transfer - exchanged between surfaces	15-5 → 15-7
13	July 28 - 30	Review	
final exam			**August ??**

SYDE 381 Recommended Problems

Weeks		Section	Problems
1	May 05 - 09	Chapter 2	2-58, 2-61, 2-84, 2-85
2	May 12 - 16	Chapter 4 & 5	4-41, 4-42, 4-79, 4-84 4-92, 4-95
3-4	May 20 - 30	Chapters 3, 5, & 6	3-39, 3-75 5-25, 5-29, 5-35, 5-42, 5-67, 5-72, 5-96 6-23, 6-37, 6-52, 6-61, 6-78, 6-87, 6-156
5-6	June 02 - 13	Chapters 7 & 8	8-29, 8-43, 8-58, 8-68, 8-99, 8-148 8-149, 8-159, 8-168, 8-183, 8-189
7-8	June 16 - 27	Chapters 10 & 11	10-20, 10-48, 10-59, 10-70, 10-75, 10-92 10-117, 10-123, 10-151, 10-156, 10-162 11-14, 11-20, 11-36, 11-41, 11-46, 11-53, 11-104
9-10	June 30 - July 11	Chapters 12, 13, & 14	12-41, 12-48, 12-53, 12-68, 12-74, 12-78, 12-81 13-39, 13-47, 13-55 14-19, 14-25, 14-42, 14-48
11-12	July 14 - 25	Chapter 15	15-27, 15-33, 15-49, 15-50, 15-77, 15-79 15-86, 15-106, 15-107
13		Review	