

Tentative Course Syllabus

ME 211: Thermodynamics I

Updated 12/4/2017 10:31 AM

A journey of a thousand miles begins with a single step. – Lao Tzu, 6th century BCE

Instructor: Professor Duane Abata, Mechanical Engineering, Rm CM124/125

Textbook: **Thermodynamics an Engineering Approach**, Y. A. Cengel, M. A. Boles, 8th Edition, 2015, McGraw-Hill.

	day	date	material covered	homework <u>due</u>
1	M	Aug 21	Introduction	1-9 (in class)
2	W	Aug 23	Thermodynamics and Energy Dimensions and Units Systems and Control Volumes Properties of a System	1-11E, 1-15E, 1-18C ¹ , 1-20C, 1-21C, 1-25C, 1-26C
3	F	Aug 25	Density and Specific Gravity State and Equilibrium Processes and Cycles	1-10, 1-31C, 1-32C
4	M	Aug 28	Temperature Pressure Pressure Measurement Devices Problem Solving Technique	1-34, 1-35E, 1-36, 1-51, 1- 67
5	W	Aug 30	Forms of Energy Energy Transfer by Heat	2-6C, 2-8E, 2-17C, 2-26C, 2-30, 2-31E
6	F	Sep 1	Energy Transfer by Work Mechanical Forms of Work	2-38C, 2-41E, 2-55C, 2-68
	M	Sep 4	Labor Day	
7	W	Sep 6	The First Law of Thermodynamics Energy Conversion Efficiencies	2.45, 2-47, 2-48E
8	F	Sep 8	2-8 Energy and the Environment 3-1 The Pure Substance	2-80E, 2-82, 2- 110E, 3-1C, 3-2C, 3-7C
9	M	Sep 11	3-2 Phases 3-3 Phase Change Processes 3-4 Property Diagrams 3-5 Property Tables	3-13C, 3-20, 3-24E, 3-28
10	W	Sep 13	3-5 Property Tables	3-23, 3-26, 3-35E
11	F	Sep 15	M Day – no class	
12	M	Sep 18	3-6 Ideal Gas Law	3-48, 3-62
13	W	Sep 20	3-7 Compressibility	3-68, 3-69, 3-71
14	F	Sep 22	3-8 Other Equations of State	3-74, 3-85
15	M	Sep 25	4-1 Moving Boundary Work 4-2 Energy Balance for Closed Systems	3-94, 3-100
16	W	Sep 27	4-3 Specific Heats 4-4 Internal Energy, Enthalpy, Specific Heats of Ideal Gases	4-1C, 4-2, 4-8, 4- 26E, 4-33 in class

¹ Problems designated by a 'C' are concept questions. There is no need to write the answers in your notebook unless you wish to do so however be prepared to discuss these problems in class.

17	F	Sep 29	4-5 Internal Energy, Enthalpy, Specific Heats of Solids and Liquids Topics of Special Interest (skim)	4-45C, 4-48C, 4-55 a,c
18	M	Oct 2	5-1 Conservation of Mass	4-64, 4-66 ² , 4-79 a,c, 4-81
19	W	Oct 4	5-2 Flow Work and the Energy of a Flowing Fluid	4-110, 5-2C, 5-10, 5-15,
20	F	Oct 6	5-3 Energy Analysis of Steady Flow Systems	5-17C, 5-19, 5-20E
	M	Oct 9	Native American Day	
21	W	Oct 11	5-4 Some Steady-Flow Engineering Devices, Nozzles and Diffusers	5-26E
22	F	Oct 13	Turbines and Compressors, Review	5-28, 5-30
23	M	Oct 16	1 st Hour Exam	
24	W	Oct 18	Exam Discussion, Throttling Valves	5-46, 5-54
25	F	Oct 20	Heat Exchanges and Mixing Chambers	5-62, 5-78
26	M	Oct 23	Pipe and Duct Flow	5-71, 5-72
27	W	Oct 25	5-5 Energy Analysis of Unsteady Flow Processes	5-83, 5-91E, (read 5-113 and 5-114; we will do in class)
28	F	Oct 27	6-1 Introduction to the Second Law 6-2 Thermal Energy Reservoirs 6-3 Heat Engines	6-10C, 6-11C, 6-15, 6-20
29	M	Oct 30	6-5 Perpetual Motion Machines 6-6 Reversible and Irreversible Processes 6-7 The Carnot Cycle	6-23, 6-24, 6-47E
30	W	Nov 1	7-1 Entropy 7-2 The Increase of Entropy Principle	6-58C, 6-60C, 6-66C. 6-74, 6-77, 6-81
31	F	Nov 3	7-3 Entropy Change of Pure Substances 7-4 Isentropic Processes 7-5 Property Diagrams Involving Entropy	7-7C, 7-10C, 7-20 in class, 7-21, 7-31, 7-32, 7-34E in class
32	M	Nov 6	no class	7-35, 7-60
33	W	Nov 8	no class	7-65, 7-71
	F	Nov 10	Veterans Day	
34	M	Nov 13	7-7 The Tds Relations 7-8 Entropy Change of Liquids and Solids 7-9 Entropy Change of Ideal Gases	7-73, 7-84
35	W	Nov 15	7-10 Reversible Steady Flow Work 7-11 Minimizing the Compressor Work	7-80, 7-85
36	F	Nov 17	Review	6-121, 6-125, 7-105, 7-241
37	M	Nov 20	2 nd Hour Exam	
	W	Nov 22	Thanksgiving Recess	
	F	Nov 24	Thanksgiving Recess	
38	M	Nov 27	Exam Discussion, Chapter 9 Heat Engines and Cycle Analysis 9-3 Air Standard Assumptions	

² From this point onward, use constant specific heats rather than variable specific heats.

			skim 9-4 Overview skim 9-5 SI Engines skim 9-6 CI Engines	
39	W	Nov 29	Chapter 10 Rankine Cycles 10-2 The Simple Rankine Cycle	9-1C, 9-3C, 9-4C, 9-9C, 9-13
40	F	Dec 1	10-5 Rankine Cycle with Reheat	10-12
41	M	Dec 4	Review	10-14, 10-30 in class
	W	Dec 6	No Class Day	
	F	Dec 8	Final Exam at 10 – 11:50 am in Rm 204W	

Review problems for the Final Exam:

- 1-119 to 1-124
- 2-125 to 2-134
- 3-134 to 3-142
- 4-144 to 4-161
- 5-192 to 5-207
- 6-156 to 6-171
- 7-226 to 7-245
- 10-116 to 10-118
- 10-121 to 10-123

As of 08/17/17:

The Final Exam for this course is scheduled on
December 8, 2017 at 10-11:50 am. in
Rm 204W (same as class)

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