

AME 20231: THERMODYNAMICS

Syllabus: Spring 2011

<u>Date</u>	<u>Topic</u>	<u>Reading</u> ^{1,2}	<u>Problems</u> ^{1,3}
<u>January</u>			
W, 1/19	Introduction	(M0)	
F, 1/21	Concepts/Definitions	1-27(M1)	1.15, 1.31, 1.41
M, 1/24	Mechanical Forms of Work and Energy	36-51(M2, 1-12)	2.7, 2.32, 2.36
W, 1/26	Internal Energy and Heat Transfer	53-58(M2, 13-24)	2.47, 2.52
F, 1/28	First Law for a Closed System	58-68, 70-76(M2, 25-30)	2.56, 2.59, 2.87
M, 1/31	Thermodynamic Properties: Phase Change	90-106(M3, 1-12)	3.5, 3.21, 3.36
W, 2/2	Thermodynamic Properties: Internal Energy, Enthalpy and Specific Heats	106-109, 112-115 117-121(M3, 13-28)	3.42a-e, 3.59, 3.89
F, 2/4	Thermodynamic Properties: Compressibility & Ideal Gases	122-131, 133-137 (M3, 29-37)	3.107, 3.129, 3.140
<u>February</u>			
M, 2/7	Thermodynamic Properties: Polytropic Processes (Quiz)	141-144 (M3, 38)	-----
W, 2/9	Exam 1	-----	-----
F, 2/11	Control Volumes: Conservation of Mass and Energy	162-169(M4, 1-11) 172-177	4.7, 4.10
M, 2/14	Steady-State Applications	177-188(M4, 12-20)	4.46, 4.63, 4.65
W, 2/16	Continued	189-199, 210(M4, 21-28)	4.73, 4.106
F, 2/18	Second Law of Thermodynamics	234-246(M5, 1-9)	5.19, 5.35, 5.43
M, 2/21	Continued	256-267(M5, 10-19)	5.65, 5.70
W, 2/23	Entropy Relations	280-295(M6, 1-13)	6.3, 6.17, 6.35
F, 2/25	Isentropic Processes	315-335(M6, 14-25)	6.134, 6.147, 6.163
M, 2/28	Continued (Quiz)	-----	-----

¹ From the text book (*Fundamentals of Engineering Thermodynamics, 7e*, by Moran and Shapiro) and power point modules (M).

² Reading should be done before lecture.

³ Problems are to be done after lecture and will be collected each Friday before the start of lecture.

<u>Date</u>	<u>Topic</u>	<u>Reading</u>	<u>Problems</u>
<u>March</u>			
W, 3/2	Exam 2	----	----
F, 3/4	Rankine Cycle	425-447(M7, 1-9)	8.13, 8.20
M, 3/7	Superheat, Reheat & Regeneration	447-459(M7, 10-19)	8.27, 8.37
M, 3/7- F, 3/11	Tours of Notre Dame Power Plant⁴	---	---
W, 3/9	Special Cases	463-467(M7, 20-27)	8.80
F, 3/11	Reciprocating Gas Cycles	494-505, 535-537(M8, 1-8)	----
3/12-3/20 Spring Break			
M, 3/21	Brayton Cycle	509-521(M8, 9-14)	9.45, 9.54
W, 3/23	No class	---	---
F, 3/25	Reheat, Regeneration & Intercooling	521-535(M8, 15-22)	9.67, 9.77
M, 3/28	Combined Cycles & Turbojet Engines	537-539, 544-550 (M8, 23-33)	9.86, 9.94a,b
W, 3/30	Refrigeration Systems	588-604(M9, 1-11)	10.16, 10.21
<u>April</u>			
F, 4/1	Heat Pump & Gas Refrigeration Systems	606-619 (M9, 12-19)	10.40, 10.48
M, 4/4	Continued (Quiz)	---	---
W, 4/6	Exam 3	---	---
F, 4/8	Perfect Gas Mixtures	704-726(M10, 1-14)	12.18, 12.32a,b
M, 4/11	Psychrometrics	727-739(M10, 15-25)	12.48, 12.55
W, 4/13	(De) Humidification	741-752(M10, 26-31)	12.84
F, 4/15	Evaporative Cooling	752-762(M10, 32-35)	12.103
M, 4/18	Combustion Parameters	776-786(M11, 1-10)	13.16, 13.31
W, 4/20	Enthalpy of Formation & Heating Values	787-789(M11, 11-17)	13.63b,d
4/22-4/25 Easter Break			
W, 4/27	Energy Balance & Adiabatic Flame Temperature	789-800(M11, 18-21)	13.53, 13.64
F, 4/29	Combustion (Continued)	---	13.72, 13.74
<u>May</u>			
M, 5/2	Contingencies	---	---
W, 5/4	Review	---	---

⁴ To accommodate student schedules, tours will be conducted from 3:00 to 4:30 p.m. on Monday, Wednesday and Friday and from 11:00 a.m. to 12:30 p.m. on Tuesday and Thursday. Participation is mandatory. Class is cancelled on Wednesday, March 23 to compensate for time spent on the tour.