



APPLIED THERMODYNAMICS (SMJ 3403)

Detail Syllabus

Week	Topics	Notes
1	INTRODUCTION Know your instructor; Meeting hours; Syllabus; My teaching philosophy; Your expectation; Lecture notes; Language; URL Address: www.fkm.utm.my/~nazrikh/smj3403/index.htm ; Grading scheme; Reference books; Attendance sheet; etc.	
1-3	Chapter 1: RECIPROCATING AIR-COMPRESSOR 1-1 Introduction; 1-2 Reciprocating Air-Compressor; 1-3 The Conditions for Minimum Work; 1-4 Isothermal Efficiency; 1-5 Reciprocating Compressor with Clearance Volume; 1-6 The Volumetric Efficiency; 1-7 Multistage Compression with Intercooling; 1-8 Ideal Intermediate Pressure; Examples	Homework #1
4-5	Chapter 2: VAPOR POWER PLANT 2-1 Introduction; 2-2 The Rankine Cycle; 2-3; Rankine Cycle's Efficiencies; Specific Steam Consumption; 2-4 Rankine Cycle with Superheat; 2-5 The Enthalpy-Entropy (h-s) Chart; 2-6 The Reheat Cycle; 2-7 The Regenerative Cycle; Open and Closed Feedwater Systems.	Test #1 (10 %): Covers Chap 1 & 2
6-7	Chapter 3: GAS TURBINES 3-1 Introduction; 3-2 The Practical Gas Turbine Cycle; Thermal Efficiency; Work Ratio; 3-3 Multi-Stage Expansion; 3-4 Modifications to the Basic Cycle; (a) Intercooling; (b) Reheat; (c) Heat Exchanger; Examples.	Homework #2
8-10	Chapter 4: REFRIGERATION 4-1 Introduction; 4-2 Reversed Heat Engine Cycle; Coefficient of Performance (COP); 4-3 Reversed Carnot Cycle; 4-4 Vapor-Compression Refrigeration Cycles; (a) Use of Throttle Valve; (b) Condition at Compressor Inlet; (c) Undercooling of Condenser Vapor; 4-5 The Pressure-Enthalpy (p-h) Diagram; 4-6 The Use of the Flash Chamber; Examples.	Test #2 (15 %): Covers Chap 3 & 4
11-13	Chapter 5: RECIPROCATING IC ENGINES 5-1 Introduction; 5-2 An Overview of Reciprocating Engines (Cengel); 5-3 Otto Cycle – The Ideal Cycle for SI Engines (Cengel); 5-4 Diesel Cycle – The Ideal Cycle for CI Engines (Cengel); 5-5; Criteria of Performance (Eastop); 5-6 Morse Test (Eastop); 5-7 Performance Characteristics; Examples.	Homework #3

Week	Topics	Notes
14-15	Chapter 6: HEAT TRANSFER 6-1 Introduction; 6-2 Fourier's Law of Conduction; 6-3 Newton's Law of Cooling; 6-4 The Composite Wall and Electrical Analogy; 6-5 Heat Flow Through Cylinder and Sphere; 6-6 Heat Exchanger; (a) Parallel Flow; (b) Counter flow; Examples.	Test #3 (15 %): Covers Chap 5 & 6
THE END		

Instructor: NAZRI B KAMSAH, *Ph.D*
 Room: C25-409
 Phone: 07-5534676
 Email: nazrikh@fkm.utm.my

Course Website: Students are strongly encouraged to visit the website, dedicated for this course. Students can open and download the lecture notes in PDF format, and look for latest announcements regarding the course. Make sure that you have Adobe Acrobat Reader installed on your computer. The address is: www.fkm.utm.my/~nazrikh/smj3403/index.htm. Links to many thermodynamics websites on the internet are also available.

Grading:

Homeworks	: 20 %
Tests (3)	: 40 %
Final Exam	: 40 %

Note: The due date for all homeworks will be announced during class meetings. No grade will be given to homeworks which are submitted late!

Reference Books:

1. T. D. Eastop and A. McConkey, "Applied Thermodynamics for Engineering Technologists", 5th Edition, Pearson Education Limited, England, 1993.
2. Y. A. Cengel and M. A. Boles, "Thermodynamics: An Engineering Approach", 4th Edition, McGraw-Hill, Inc., New York, 2002.
3. G. F. C. Rogers and Y. R. Mayhew, "Engineering Thermodynamics: Work and Heat Transfer", 4th Edition, Longman, England, 1992.
4. M. J. Moran and H. N. Shapiro, "Fundamental of Engineering Thermodynamics", 1st Edition, John Wiley & Sons Inc., New York, 1988.
5. R. E. Sontag and G. A. Wylen, "Introduction to Thermodynamics: Classical and Statistical", 2nd Edition, John Wiley & Sons Inc., New York, 1982.
6. F. P. Incropera and D. P. De Witt, "Introduction to Heat and Mass Transfer", 4th Edition, John Wiley & Sons Inc., New York, 2002.

Nazri B Kamsah, *Ph.D*
May 20, 2003

