ME 203 : THERMODYNAMICS I

Fall Semester 2007-2008 (071)

Instructor: **Dr. S. Z. Shuja**   *Office:* **22-216;**   *Phone:* **4465**

Catalog Data: System and control volume concepts. Properties of a pure substance. Work and heat. The first law of thermodynamics as applied to a system and a control volume, internal energy, enthalpy. The second law of thermodynamics. Carnot cycle, entropy, reversible and irreversible processes. Applications of steady-state steady-flow, uniform-flow, and other processes.   **Prerequisites:** MATH 102, PHYS 102.

Textbook: Cengel, Y. A. and Boles, M. A. **THERMODYNAMICS: An Engineering Approach**. McGraw Hill, 5th Edition 2006.

References: 1) Sonntag, R. E., Borgnakke, C. and Van Wylen, G. J. **Fundamentals of Thermodynamics**. John Wiley & Sons.
2) Black, W.Z. and Hartley, J.G. **Thermodynamics**, Harper Collins Publishers.
3)   Michael J. Moran and Howard N. Shapiro**. Fundamentals of Engineering Thermodynamics**, John Wiley & Sons.

Objectives:	*Outcomes*
To familiarize the students with the basic concepts of the first and second laws of thermodynamics and their applications in engineering problems.	Demonstrate a basic understanding of the nature of the thermodynamic processes for pure substances and ideal gases.
	Demonstrate a basic understanding of the first and second laws of thermodynamics and its applications to systems and control volumes.
To provide the student with a comprehensive treatment of classical thermodynamics.	Demonstrate the ability to use the first and second laws of thermodynamics for energy conservation and entropy balance analysis of different thermodynamic processes of systems and control volumes.
	Demonstrate the ability to evaluate the thermal performance of different heat engines and refrigeration cycles through the calculation of thermal efficiency or coefficient of performance.
To prepare the student to effectively use thermodynamics in the practice of engineering.	Demonstrate the ability to present practical engineering calculations based on the first and second law analyses of different thermodynamic processes of systems and control volumes.

Course Breakdown:

Classes (50 minutes)	Topics
4	Basic Concepts and Definitions.
8	Properties of Pure Substances.
5	Energy Transfer by Heat and Work.
11	The First Law of Thermodynamics.
4	The Second Law of Thermodynamics.
11	Entropy and Second Law Analysis.
2	Tests

Attendance: Attendance will be strictly observed and each absence will result in a deduction of 0.5 point of the final grade.

Homework: A homework will be assigned at the beginning of each week and is due a week later. Late homework will not be accepted.

Evaluation:

Exam 1	**Oct. 29, 2007**	**7-8 pm**	10%
Exam 2	**Nov. 25, 2007**	**7-9 pm**	20%
Exam 3	**Jan. 07, 2007**	**7-8:30 pm**	15%
Quizzes			15%
Homework			10%
Final Exam (Comprehensive)			30%

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