Syllabus

ME 0051 – Introduction to Thermodynamics

Spring Semester 2023

Lecture Time	Tue. 08:15 – 11:00	**Instructor**	Dr. John Pien
Classroom	3-106	**Office**	4-223
Office Hours	Tue. 13:00 – 16:00	**Email**	john.pien@scupi.cn

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Catalog Description

This 3-credit course is an introduction into classical thermodynamics to provide an understanding of the basic concepts that relate to thermodynamic systems. Topics covered will include conservation of energy, work, heat, power systems, power cycles, energy analysis of closed systems and open systems, introduction to thermodynamic cycles and entropy. Prerequisite: *PHYS 0174, CHEM 0960*.

Required Textbook

Borgnakke and Sonntag, *Fundamentals of Thermodynamics*, 10th Edition, Wiley.

Course Outcomes

- Define and state the first law of thermodynamics.
- Define terms such as heat, work, energy and thermal efficiency.
- Identify and describe various forms of energy.
- Describe and define various forms of energy processes such as heat engines, refrigeration and heat pumps.
- Apply first law analysis to thermodynamic system components.
- Apply reversible analysis to thermodynamic systems.
- Apply irreversible analysis to thermodynamic systems.

Course Outline

- Introduction (Ch. 1)
- Properties of a Pure Substance (Ch. 2)
- Energy Equation and First Law of Thermodynamics (Ch. 3)
- Energy Analysis for a Control Volume (Ch. 4)
- The Second Law of Thermodynamics (Ch. 5)
- Entropy (Ch. 6)
- Entropy Analysis for a Control Volume (Ch. 7)
- Power and Refrigeration Systems (Ch. 9 and 10)

Course Grading

Homework	15%
Quiz/Project	10%
Midterm Exam I	20%
Midterm Exam II	25%
Final Exam	30%

Exam Schedule

Midterm Exam I	April 11th (week 8)
Midterm Exam II	May 16th (week 13)
Final Exam	June 20th (week 18)