Syllabus

ME 0051 – Introduction to Thermodynamics

Fall Semester 2022

Lecture Time:	Fri. 08:15 – 11:00	**Instructor:**	Dr. John Pien
Classroom:	3-102	**Office:**	3-223
Office Hours:	Wed. 14:00 – 17:00	**Email:**	john.pien@scupi.cn

Teaching Assistant: Yang Fan **Email:** 2020141520071@stu.ecnu.edu.cn

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.

Additional References:

Moran, Shapiro, Boettner and Bailey, *Fundamentals of Engineering Thermodynamics*, 9th 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	5%
Exam I	20%
Exam II	25%
Final Exam	35%

Exam Schedule:

Exam I	Oct. 21st
Exam II	Nov. 25th
Final	Dec. 30th