



**THE OHIO STATE UNIVERSITY**  
COLLEGE OF ENGINEERING

# Thermodynamics

## AEROENG 2405

---

**Credit Hours:**

3.00

---

**Course Levels:**

Undergraduate (1000-5000 level)

---

**Course Components:**

Lecture

---

**Course Description:**

Aerospace engineering thermodynamics: Introduction to the concepts of energy and entropy, the First and Second Law analysis of systems and control volumes, and the analysis of power and refrigeration cycles.

---

**Prerequisites and Co-requisites:**

Prereq: 2200 (200), and AeroEng-BS student (No AAE pre-majors can enroll in this class).

---

**Course Goals / Objectives:**

- Study of energy and energy transfer mechanisms. By the end of this course, students should have a thorough understanding of the basic tools needed to analyze engineering systems where energy transfers or transformations take place

---

**Course Topics:**

- Introduction and basic concepts, forms of energy, energy transfer First law, efficiency
  - Phase, property diagrams, equation of state, compressibility
  - Energy balance for closed system
  - Internal energy, enthalpy, specific heats, mass conservation, flow work, energy analysis of steady flow
  - Steady-flow devices, unsteady flow process, second law Reversible and irreversible processes, Carnot cycle
  - Entropy, reversible steady-flow work, isentropic efficiencies, entropy balance
  - Gas power cycle, Brayton cycle, jet-propulsion cycle, Rankine cycle
  - Exams and Reviews
-

**Designation:**

Required