

- Course Number and Title: M E 503. Thermodynamics
- Catalog Description: A comprehensive study of the first and second laws of thermodynamics, nonequilibrium processes, equations of state, and statistical thermodynamics.
- Credit Hours: 3 Credits (3)
- Prerequisite(s) / Corequisite(s): Prerequisite(s): (M E 340 and M E 570) or Consent of Instructor  
Corequisite(s): None
- Required: Graduate Core
- Course Availability: Fall Semester
- Instructor (Usual): Dr. Krishna Kota (See <https://mae.nmsu.edu/people/faculty.html>)
- Textbook: *Thermodynamics: An Engineering Approach* (10th Edition) by Yunus Cengel, Michael Boles and Mehmet Kanoglu, McGraw-Hill, ISBN10: 1266664483 | ISBN13: 9781266664489
- Course Learning Objectives: After completing this course, a student should be able to:
  - 1) Apply 1<sup>st</sup> law and 2<sup>nd</sup> law of thermodynamics to closed and open systems.
  - 2) Apply 1<sup>st</sup> law and 2<sup>nd</sup> law of thermodynamics to analyze thermodynamic cycles with and without phase change and for pure substances and mixtures as the working fluids.
  - 3) Understand thermodynamic properties and their relationships.
  - 4) Understand thermodynamic equilibrium and stability.
  - 5) Understand the basics of statistical thermodynamics and its differences from classical thermodynamics
- Topics Covered:
  - Introduction & Basic Concepts
  - Energy and Entropy
  - Carnot Cycle
  - 1<sup>st</sup> Law and 2<sup>nd</sup> Law Efficiencies of Closed and Open Systems
  - Rankine Cycle
  - Thermodynamic Potentials and Property Relations
  - Thermodynamic Equilibrium
  - Thermodynamic Stability
  - Brayton Cycle
  - Statistical Thermodynamics