- **Course Number and Title:** M E 483. Introduction to Combustion
- **Catalog Description:** Introduction to combustion kinetics, combustion thermochemistry, flame dynamics, flame stability, and pollutant formation. Course coverage includes laminar and turbulent flames, premixed and diffusion flames, and detonations. Emphasis is placed on the role of chemical kinetics, heat transfer, mass transfer, and fluid dynamics on flame structure and flame stability. Crosslisted with M E 583.
- **Credit Hours:** 3 Credits (3)
- **Prerequisite(s) / Corequisite(s)** Prerequisite(s): M E 228 and M E 340
  Corequisite(s): None
- **Required:** Elective for BSME or BSAE Degree
- **Course Availability:** Every other three semesters: Fall 2025 – Spring 2027 – Fall 2028 – …
- **Instructor (Usual):** Dr. Yanxing Wang (See https://mae.nmsu.edu/people/faculty.html)
- **Textbook:** Turns, S.R., *An Introduction to Combustion: Concepts and Applications*, 3rd Ed., McGraw-Hill, 2011 (ISBN-10: 0073380199 or ISBN-13: 978-0073380193)
- **Course Learning Objectives:** After completing this course, a student will get an understanding of:
  1) Reaction rates of chemical processes;
  2) Simplified reactor models based on coupled chemical and thermal analysis;
  3) Conservation/transport equations for reacting flows;
  4) Structure and propagation limits of laminar premixed combustion waves;
  5) Structure and controlling processes in laminar diffusion flames;
  6) Time and spatial scales in turbulent flames, and basic issues in turbulent combustion.
- **Topics Covered:**
  - Chemical kinetics
  - Coupled chemical and thermal analysis
  - Conservation equations
  - Laminar premixed combustion
  - Laminar non-premixed combustion
  - Turbulent flames