

- Course Number and Title: M E 401. Building Energy and Environment
- Catalog Description: Building energy and greenhouse gas emissions; energy usage distribution in residential and commercial buildings, HVAC, other end use entities (lighting, water heating, refrigeration, and computers and electronics), energy efficiency in buildings, indoor air quality, air filtration and purification, economics
- Credit Hours: 3 Credits (3)
- Prerequisite(s) / Corequisite(s): Prerequisite(s): M E 340 and M E 341  
Corequisite(s): None
- Required: Elective for BSME or BSAE Degree
- Course Availability: Spring Semester
- Instructor (Usual): Dr. Sarada Kuravi (See <https://mae.nmsu.edu/people/faculty.html>)
- Textbook:
  1. Zhai, Z.J., *Energy Efficient Buildings: Fundamentals of Building Science and Thermal Systems*, 1st Ed., Wiley, 2022 (ISBN-10: 1119881935, ISBN-13: 978-1119881933)
  2. Mitchell, J.W., and Braun, J.E., *Heating, Ventilation and Air-Conditioning in Buildings*, 1st Ed., Wiley, 2012 (ISBN-10: 0470624574. ISBN-13: 978-0470624579)
- Course Learning Objectives: After completing this course, a student should be able to:
  - 1) Gain a basic understanding of the energy usage in buildings and their impact on the environment.
  - 2) Calculate the energy loads for various end use entities and understand their role in building energy.
  - 3) Analyze HVAC systems and heat transfer and apply the knowledge for realizing energy efficiency in buildings.
  - 4) Write a technical term paper discussing the current and future trends on the topics of building energy and environmental impact and indoor air quality.
- Topics Covered:
  - Building energy basics
  - Air properties and psychrometry
  - Climate analysis
  - Indoor thermal comfort
  - HVAC and heat transfer in buildings
  - Energy efficiency
  - Air quality and monitoring
  - Air filtration and purification