

- Course Number and Title: A E 419. Propulsion
- Catalog Description: Propulsion systems, thermodynamic cycles, combustion, specific impulse; principles of gas turbines, jet engines, and rocket propulsion systems
- Credit Hours: 3 Credits (3)
- Prerequisite(s) / Corequisite(s): Prerequisite(s): A E 439
Corequisite(s): None
- Required: Required for BSAE Degree
- Course Availability: Fall and Spring Semesters
- Instructor (Usual): Dr. Andreas Gross / Dr. Qiong Liu (See <https://mae.nmsu.edu/people/faculty.html>)
- Textbook: Mattingly, J.D., and Boyer, K.M., *Elements of Propulsion: Gas Turbines and Rockets*, 2nd Ed., AIAA Education Series, 2016 (ISBN-10: 1624103715 or ISBN-13: 978-1624103711)
- Course Learning Objectives: After completing this course, a student should be able to:
 - 1) Obtain knowledge of relevant fluid and thermodynamics.
 - 2) Understand jet engine operating principles.
 - 3) Carry out parametric analysis of jet engine.
 - 4) Analyze turbomachinery.
 - 5) Know how to analyze rocket propulsion systems.
- Topics Covered:
 - Brief history of propulsion
 - Classification and performance trends
 - Review of fluid dynamics and thermodynamics
 - Fundamentals of jet engines
 - Jet engine parametric cycle analysis
 - Component performance
 - Parametric cycle analysis of real turbojet engine (self-directed study)
 - Turbomachinery
 - Rocket propulsion