

ABET Course Syllabus**ENAE 457 Space Propulsion and Power**

Credits & Contact Hours:	3 credits (3 hours of lecture)
Course Status:	Required
Schedule:	Offered every Fall semester
Course Description:	Thermodynamic cycle analysis, aerothermochemistry of fuels and propellants, operating principles of rocket, ion, and other exoatmospheric power units.
Pre-Requisites:	Offered every fall semester
Co-Requisites:	None
Textbooks:	(1) G. Sutton and O. Biblarz. Rocket Propulsion Elements. Wiley Interscience, seventh edition, 2000
Other Required Material:	Course notes supplements material in the text
Course Oversight:	Aerodynamics and Propulsion Committee
Syllabus Prepared By/Date:	Dr. Raymond Sedwick June, 2011

Course Objectives/Student Learning Outcomes:

1. Analyze a rocket engine system to determine its specific impulse and performance.
2. Be able to characterize the advantages and disadvantages of a given rocket engine system in the context of its application to a real flight vehicle and mission.
3. Understand the fundamental technology hurdles facing the designer of a space propulsion system, including the key fluids, controls, and thermodynamic issues facing each major component of an engine.
4. Analyze the performance of a rocket engine and its relation to a required mission.
5. Be equipped to evaluate new space propulsion cycles, and appreciate the directions and promise of upcoming developments in engine technology.

Topics Covered:

1. Fundamentals of space propulsion in a mission context
2. Overview and taxonomy of current propulsion technologies
3. Thermodynamics of reacting flows
4. Nozzle design and operation
5. Liquid and solid chemical engines

Relationship of Course Objectives to Program Outcomes

This course addresses program outcomes: 1, 2, 3, 4, 5, 7, 8, 10, 14, 15