DEPARTMENT OF AERONAUTICS AND ASTRONAUTICS

AA462 ROCKET PROPULSION

Spring Quarter 2012

CREDITS AND CONTACT HOURS: 3 credits, Three 50-minute lectures per week.

COORDINATORS: Undergraduate Committee, April 2013

TEXTBOOK: Rocket Propulsion Elements, 8th ed., G.P. Sutton and O. Biblarz, John Wiley & Sons, Inc., New York, NY, 2010.

SUPPLEMENTAL MATERIALS: none.

CATALOG DATA: ROCKET PROPULSION, Selective Elective
Covers the physical and performance characteristics of chemical rocket propulsion systems. Includes combustion chamber thermochemistry, propellant properties and handling, and rocket system component interactions.
Offered: Sp.

PREREQUISITES BY TOPICS:
1. Calculus and analytic geometry
2. Differential equations
3. Chemistry
4. Thermodynamics
5. Fluid dynamics

OUTCOMES:
1. Students will become proficient at carrying out performance calculations for typical chemical rocket systems.
2. Reasons behind rocket component selection and design based on physical properties of propellants will be understood.

RELATIONSHIP TO ABET OUTCOMES:
a) An ability to apply knowledge of mathematics, science, and engineering.
b) An ability to design a system, component, or process to meet desired needs.
c) An ability to identify, formulate, and solve engineering problems.
d) A recognition of the need for, and an ability to engage in life-long learning.
e) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

TOPICS:
1. Overview and fundamentals of rocket performance
2. Chemical propellant properties: liquid, solid, gaseous
3. Materials and process engineering, component selection
4. Rocket systems: monopropellants, bi-props, solids, hybrids