ENAE 415 Helicopter Theory

Credits & Contact Hours: 3 credits (3 hours of lecture)

Course Status: Not required

Schedule: Offered every Fall semester

Course Description: Elementary exposition on the theory and practice of aerodynamics applied to helicopters and other rotary wing aircraft.

Pre-Requisites: ENAE 414

Textbooks:

Other Required Material: Course lecture notes and handouts

Course Oversight: Aerodynamics and Propulsion

Syllabus Prepared By/Date: Dr. J. Gordon Leishman, August 2010

Course Objectives/Student Learning Outcomes:
1. To provide an introductory treatment of the aerodynamic theory of rotary-wing aircraft
2. To study the fundamentals of rotor aerodynamics for rotorcraft in hovering flight, axial flight, and forward flight modes
3. To perform blade element analysis, investigate rotating blade motion, and quantify basic helicopter performance

Topics Covered:
1. Introduction to Rotating-Wing Aircraft
2. History of Helicopters and their Technology
3. Momentum Theory Analysis of Rotors
4. Blade Element Theory of Rotors
5. Blade Flapping Dynamics & Rotor Control
6. Helicopter Performance Characteristics
7. Design of Helicopters

Relationship of Course Objectives to Program Outcomes
This course addresses program outcomes: