AE 6334 – Rotorcraft Design II

CATALOG DESCRIPTION (25 words or fewer):

Preliminary design of traditional, urban air mobility, unmanned rotorcraft vehicles.

Hours: 1(lecture) + 4(studio) + 0(lab) = **3 credit hours**

PREREQUISITES:

Graduate standing or consent of instructor

TEXTBOOKS:

J. Leishman, *Principals of Helicopter Dynamics* (2nd ed.), Cambridge University Press, 2006.

COURSE OBJECTIVES:

Implementation of rotary wing aircraft design methodology through team-oriented project work culminating in a conceptual design of a contemporary vertical lift aircraft that satisfies the RFP as specified in the annual VFS Student Design Competition.

LEARNING OUTCOMES:

Students will complete projects culminating in the conceptual design of a relevant aircraft to meet given specifications. Specifically, students will:

1. Devise an analysis plan and conduct subsystem sizing, computational design, and performance evaluation
2. Integrate accepted design principles and methods with design needs and requirements, including ethical and societal obligations and trade studies into the design process in application-specific environments
3. Effectively communicate technical information in both written and oral formats
4. Strategize and implement a design project according to specifications using project and time management strategies
5. Demonstrate effective interpersonal communication, leadership, and constructive feedback skills in teamwork settings

Covered Topics:

1. Introduction to Design; Course Logistics
2. Project overview and team forming
3. Socio-Economic and Ethical Considerations in Design; Professional Ethics
4. Regulatory Issues
5. Transmission Layout
6. Stability & Control
7. Structural Design, Loads, Fatigue
8. Team Endeavors
9. Flight Control System Design
10. Rotor Hub Design
11. Aircraft Sizing
12. Higher Fidelity Airloads Development
13. Other Topics (e.g., VFS Competition)
14. Guided work on semester project