ENG ME 201 Introduction to Aircraft Performance

2008 - 2009 Catalog Data:

ENG ME 201 Introduction to Aircraft Performance

Introduction to the fundamental concepts in aerospace engineering including basic fluid mechanics, the science of flight, and aircraft performance parameters. 2 cr.

Class/Lab Schedule: 2 lecture hours per week

Status in Curriculum: Required in Aerospace Program

Textbook(s) and/or Other Required Material: J.D. Anderson, Introduction to Flight, McGraw Hill, 1978.

Coordinator: Sheryl Grace, Associate Professor, Mechanical Engineering.

Prerequisites by Topic: None

Goals:

This course is designed to introduce students to the issues and parameters which impact commercial and military flight. The students will learn basic concepts necessary for analyzing subsonic and supersonic aeronautical missions. The students will be introduced to aerodynamics, propulsion, and performance. The students will learn to use appropriate software to design a wing given certain aerodynamic requirements. They will then build and test their wings.

Course Learning Outcomes:

As an outcome of completing this course, students will: i. Have taken part in general discussions on aircraft. (A, E)

ii. Have the ability to analyze the basic performance parameters for a subsonic aircraft. Basic aerodynamics, thrust and power curves, endurance and range, take-off and landing. (A, E, AE:M)

iii. Gain familiarity with presenting *complete* solutions to technical problems following an acceptable engineering format. This includes computer generated graph with sufficient annotation to be explanatory. It also includes physical interpretation of the results and comments on validity of the derived solution. (G, L)

iv. Learn to see equations as representations of physical phenomenon and learn how previous mathematics courses are useful when studying an engineering topic. (A, E)

v. Begin to use computer tools for obtaining and presenting solutions. In particular Matlab and Linair. (K)

vi. Design build and test a balsa wood wing in teams of two. (D,N)

Course Learning Outcomes mapped to Program Outcomes:

(For Program Outcomes, please see attached page or Department Web Site)

Program:	А	В	С	D	Е	F	G	Η	Ι	J	Κ	L	Μ	Ν
Course:	i, ii,			vi	i, ii,						v	iii		
	iv				iv									
Emphasis:	5	1	1	2	5	1	2	1	1	1	3	3	1	3

Topics (time spent in weeks):

1. History, physical fundamentals, the atmosphere (0.5)

- 2. Aerodynamics (1.5)
- 3. Propulsion (1)
- 4. Required thrust (1)
- 5. Important velocities (1)
- 6. Required power (1 lecture)
- 7. Rate of climb, glide ratio (1)
- 8. Rate of descent, ceilings, range, endurance (1)
- 9. Accelerated flight (2)
- 10. Take-off/landing (1)
- 11. Wing testing (1)
- 12. In class Exams (0.5)

Contribution of Course to Meeting the Professional Component:

Engineering Topics: 100%

Status of Continuous Improvement Review of this Course:

Date: April 1, 2008Reviewed by: Thermal/Fluid CommitteePrepared by: Sheryl GraceDate: April 1, 2009