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Course: Aircraft Performance Analysis

2 credit hours, optional

Prerequisite: Aerodynamics I

Class: Class 2010

Lecture: 01:10 ~ 03:00PM, Wed.

Room: E515

Office hours: Mon, Wed, Thu, and Fri.: 11:00AM ~ 6:00PM or by appointment.

Textbook:

John D. Anderson, *Aircraft Performance & Design*, McGraw-Hill, 1999. (imported by 滄海書局)

References:

1. Warren F. Phillips, *Mechanics of Flight*, John Wiley & Sons, Inc., 2004. (imported by 滄海書局)
2. Jan Roskam and Chuan-Tau Edward Lan, *Airplane Aerodynamics and Performance*, DARcorporation, 1997.
3. Nguyen. X. Vinh, *Flight Mechanics of High Performance Aircraft*, Cambridge University Press, 1993.
4. Carlos E. Padilla, *Optimizing Jet Transport Efficiency Performance, Operations, & Economics*, McGraw-Hill, 1997

Course Objectives:

To prepare the student the fundamental of airplane design. The airplane will be treated as a point mass and the equations of motion are derived. The only parameters which determine the performance of an airplane are wing loading (W/S), lift-to-drag ratio (L/D), thrust-to-weight ratio (T/W) and the (thrust) specific fuel consumption of the powerplant. The performances to discuss are descent and glide, cruise which includes range and endurance, climb, turn, take-off, and landing.

Course Schedule:

Week	Dates	Material Covered
1 st	02/18	Syllabus, Introduction – Atmosphere, Air-Data Systems
2 nd	02/25	Aerodynamics of the Airplane – the Drag polar
3 rd	03/04	Aerodynamics of the Airplane – the Drag polar
4 th	03/11	Aerodynamics of the Airplane – the Drag polar
5 th	03/18	Airplane Propulsion Systems
6 th	03/25	Airplane Propulsion Systems, Equation of Motion
7 th	04/01	Spring Break!! YEA!!
8 th	04/08	Equation of Motion
9 th	04/15	Steady Flight - Thrust Required, Power Required
10 th	04/22	Midterm Exam
11 th	04/29	Steady Flight - Thrust Required, Power Required
12 th	05/06	Steady Flight - Climb Performance
13 th	05/13	Steady Flight - Range, Endurance
14 th	05/20	Steady Flight - Range, Endurance
15 th	05/27	Accelerated Flight - Maneuvering and Flight Envelope
16 th	06/03	Accelerated Flight - Take-off and Landing
17 th	06/10	Accelerated Flight - Take-off and Landing
18 th	06/19	Final Exam

Grading Policy* :

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| 1. Quizzes, Home works, Class Attendances | 30% |
| 2. Midterm Exam | 30% |
| 3. Final Exam | 40% |

* I reserve the right to change the policy.