



淡江大學  
Tamkang University

## 課程計畫

Spring 2007 (九十五學年度第二學期)

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**Course:** Optimum Atmospheric Flight Trajectories

3 credit hours, Optional

**Prerequisite:** Dynamics, Linear System Theory

**Class:** Graduated, Aerospace Eng.

**Lecture:** 03:10 PM- 06:00PM, Mon.

**Room:** E826

**Office hours:** Mon, Tue, Thur, and Fri., 11:00 AM ~ 6:00 PM or by appointment

**Textbook:**

Course Notes

**References:**

1. Donald E Kirk, *Optimal Control Theory An Introduction*, Prentice-Hall, 1970.
2. Nguyen. X. Vinh, *Optimal Trajectories in Atmospheric Flight*, Elsevier Scientific Publishing, 1981.
3. Frank L. Lewis and Vassilis L. Syrmos, *Optimal Control*, 2<sup>nd</sup> edition, John Wiley & Sons, 1995. (imported by 高立圖書)

**Course Objectives:**

Many problems in science and technology require choosing the best, or the optimal, solution among all the possible solutions. One of the most challenging and fascinating optimization problems is the analysis of optimal space trajectories. It consists of finding the best trajectory, in some sense, for the motion of a vehicle in a three-dimensional space. For flight in a vacuum, in which the vehicle is subject only to gravitational forces, either from one or from many sources, and its self-generated propulsive force, the theory is very complete. A natural extension would be the analysis of the optimal trajectories in atmospheric flight.

This course is designed to motivate graduate students in pursuing research in the general area of *Optimal Trajectories*. The following topics will be covered: Optimization Theory, Atmospheric Flight Mechanics, General Properties of Optimal Trajectories, Flight in a Horizontal Plane, and Optimal Coasting Flight.

**Grading Policy:**

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| 1. Quizzes, Homeworks | 40% |
| 2. Midterm Exam       | 30% |
| 3. Final Exam         | 30% |