Department of Aeronautics and Astronautics
School of Engineering
Massachusetts Institute of Technology

Graduate Program (S.M., Ph.D., Sc.D.)

Field: Controls
Date: September 4, 2007

1. Introduction and Purpose

The graduate program in the Department of Aeronautics and Astronautics at M.I.T. provides educational opportunities in a wide variety of aerospace-related topics through academic subjects and research. The purpose of this document is to provide incoming masters and doctoral level students guidance in planning the subjects they will take during their graduate program. The suggestions outlined here are to be understood as guidance and not as a mandatory, rigid framework. The final decision as to which subjects are taken and in what sequence is to be decided between each student and their academic advisor and/or doctoral committee. In addition to these recommendations, the official S.M. and doctoral degree completion requirements must be taken into account during the design of a graduate program[1].

2. Courses for Controls

Master's level students should take 1 mathematics, plus 3 courses from the controls core, plus a total of 2 courses from the advanced core and applied controls.

Within the controls core, students should take:
- 1 of 16.31 (more applied) or 6.241
- 1 of 16.322 or 6.433 (more advanced prerequisites)
- 1 of 16.323 (broad) or 6.231

Ph.D level students should take the above plus
- A total of 5 more courses from the advanced and applied control

Mathematics

18.075	Calculus
18.100B	Analysis
18.085	Linear Algebra

Controls Core

6.241	Dynamic Systems & Control
16.31	Feedback Control Systems
16.322	Stochastic Estimation and Control

[1] Refer to the S.M., Ph.D. and Sc.D. degree requirements in Aeronautics and Astronautics section of the MIT Bulletin, or to http://web.mit.edu/aeroastro/academics/grad/index.html

6.433	Recursive Estimation
16.323	Principles of Optimal Control
6.231	Dynamic Programming and Stochastic Control

Advanced Controls:

6.245	Multivariable Control Systems
2.152	Nonlinear Control System Design
2.153	Adaptive Control: Theory and Applications
6.243J / 2.156J / 16.337J	Dynamics of Nonlinear Systems
2.098 / 15.093J	Optimization Methods
16.321/6.251/15.081	Introduction to Mathematical Programming
6.252J / 15.084J	Nonlinear Programming
6.253	Convex Analysis and Optimization
15.083J / 6.859	Integer Program Combination Optimization
16.413	Principles of Autonomy and Decision Making

Applied Controls:

16.324	Advanced Estimation for GPS and Inertial Navigation
16.333	Aircraft Stability and Control
16.335	Spacecraft Dynamics & Control
16.346	Astrodynamics