ECE-597-03 Optimal Control
Fall 2007

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There is no text for this class, you must take notes!!

Reference Textbooks:

Dynamic Optimization by A. E. Bryson, Addison Wesley (out of print)

Optimal Control Theory by Donald Kirk (now published by Dover books)

Optimal Control by Frank Lewis, Wiley

Meeting Times/Place: MTRF 2nd period in C-117.

Tentative Syllabus

Static Optimization (1.5 weeks)

Dynamic Programming (1.5 weeks)

Discrete Dynamical Systems (1 week)

Continuous Dynamical Systems (1 week)

Dynamic Optimization with Terminal Constraints (2.0 weeks)

Dynamic Optimization with Open Final Time (1.0 week)

Linear Quadratic Terminal Controllers (2.0 weeks)

Grading

Homework/Computer Assignments 100%

Notes:

(1) In general, it is ***very difficult*** to solve optimal control problems analytically. Usually numerical methods must be used. In this course you will be expected to solve simple problems and then use Matlab software to solve slightly more complicated problems.

(2) Many of the techniques you need to use will be used in at least one example in class, so pay attention to your notes.

(3) As we go through the different methods, you should begin to see a pattern in the derivation of the Euler-Lagrange equations.

(4) The topics build on the previous topics, so you really need to keep up!

(5) You are expected to do your own work. You can certainly talk with each other and help each other, but the work you hand in should be your own. As an example, if two people hand in the same Matlab and both came from the same directory, neither will receive any points!

(6) Unless specifically told otherwise on a particular problem, you are expected to work out the problem by hand (or use Matlab). *If you write on your assignment that you used Maple and are copying the answer, expect to get no points.* You can use Maple to check your answers. You cannot turn in any Maple code or plot as part of the solution to a problem.

(7) Start your homework early and ask questions.