

# MATH 652: Optimization II

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## Homework assignment 7 – due Thursday 4/1/2010

**Problem 1 (An optimal control problem).** Solve the following optimal control problem:

$$\min_{x(t)} \int_0^T x(t)^2 dt$$
$$\ddot{x}(t) = 1.$$

What are the optimal state variable  $x(t)$  and the optimal Lagrange multiplier  $\lambda(t)$ ? **(4 points)**

**Problem 2 (Project assignment).** Work on your semester project. In particular, find literature as assigned and present a 2-3 page writeup of what you have found out about the problem so far including a list of references. These pages may form part of your final report at the end of the semester. However, they should also include a brief discussion of a test problem that you intend to solve as part of your final report, as well as an outline of the algorithm you intend to use for it. **(8 points)**

*If you have comments on the way I teach – in particular suggestions how I can do things better, if I should do more or less examples, powerpoint slides vs whiteboard, etc – or on other things you would like to critique, feel free to hand those in with your homework as well. I want to make this as good a class as possible, and all comments are certainly much appreciated!*