

Topics for Quiz 2
16.060: Principles of Automatic Control
November 13, 2003

Quiz 2 will cover the material up to and including Lecture 25 (so there will be no frequency response questions). The quiz will concentrate on the material in Lectures 15-25, but you need to be familiar with the material before that as well, since these lectures build on the concepts we learned earlier in the course. Therefore, you should also review the list of topics for Quiz 1, as well as lecture notes, recitation notes, and problem sets.

Here is a list of the major topics we have covered in Lectures 15-25:

State-Space Methods

- The general solution to a state-space differential equation
- Determining stability of a system from its state-space model
- Controllability
 - what it means
 - how to determine whether a system has that property
- State-space controller design
 - pole assignment using full-state feedback

Time Domain System Design

- Root Locus
 - what is the significance of a root locus plot?
 - angle and magnitude conditions
 - 10 rules for drawing root loci
 - asymptotes: number, direction, and point of intersection
 - angles of departure from complex poles
 - K_{crit}
- Root locus for negative gain
- Controller design using root locus
 - phase-lead
 - phase-lag
 - PD