淡江大學 Tamkang University

Syllabus

Fall, 2005

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Course: Automatic Control System 3 credits

Course Objective:

Analysis and design of continuous-time control systems using frequency- and time-domain methods. The classical methods of control engineering are covered: Laplace transforms and transfer functions; root locus design; Routh-Hurwitz stability analysis; frequency response methods, including Bode, Nyquist, and Nichols; steady-state error for standard test signals; second-order system approximations; and phase and gain margin and bandwidth.

Prerequisite: Dynamics, Ordinary Differential Equations

Class: Class 2007-B, Aerospace Eng. (Junior)

Lecture: Tue: 4:10 ~ 5:00 PM, E311; Thu: 2:10 ~ 4:00PM, E311.

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

Textbook:

Richard C. Dorf and Robert H. Bishop, *Modern Control Systems*, 10th ed., Pearson Education, Inc., 2005. (Imported by 偉明圖書有限公司)

Course Schedule:

Week	Dates	Material covered
1st week	09/13, 09/15	Syllabus, Introduction to Control Systems.
2nd week	09/20, 09/22	Mathematic Methods of Systems
3rd week	09/27, 09/29	Mathematic Methods of Systems, State Variable Methods
4th week	10/04, 10/06	State Variable Methods, Feedback Control system Characteristics
5th week	10/11, 10/13	Feedback Control system Characteristics,1st Exam (7:00~9:00 PM, 10/14, Friday),
6th week	10/18, 10/20	The Performance of Feedback Control Systems
7th week	10/25, 10/27	The Stability of Linear Feedback Systems
8th week	11/01, 11/03	The Root Locus Method
9th week	11/08, 11/10	The Root Locus Method
10th week		2nd Exam (11/17)
11th week	11/22, 11/24	Frequency Domain Method
12th week	11/29, 12/01	Frequency Domain Method
13th week	12/06, 12/08	Stability in the Frequency Domain
14th week	12/13, 12/15	Stability in the Frequency Domain, 3rd Exam (7:00~9:00 PM, 12/16, Friday),
15th week	12/20, 12/22	Design of Feedback Control Systems ,
16th week	12/27, 12/29	Design of Feedback Control Systems ,
17th week	01/03, 01/05	Design of Feedback Control Systems , 4th Exam (01/05)
18th week		

Grading Policy*:

1. Quizzes, Homeworks, Class participation, 30%
2. Exams,
   - 1st Exam includes: Introduction to Control Systems (Chapter 1), Mathematic Methods of Systems (Chapter 2), State Variable Methods (Chapter 3), and Feedback Control system Characteristics (Chapter 4), 15%
   - 2nd Exam includes: The Performance of Feedback Control Systems (Chapter 5), The Stability of Linear Feedback Systems (Chapter 6), and The Root Locus Method (Chapter 7), 15%
   - 3rd Exam includes: Frequency Domain Method (Chapter 8) and Stability in the Frequency Domain (Chapter 9) 15%
   - 4th Exam includes: Design of Feedback Control Systems (Chapter 10) 25%

Useful Links:

1. The MCS website: http://www.prenhall.com/dorf .
2. Control Tutorials for Matlab (http://www.engin.umich.edu/group/ctm/)

* I reserve the right to change the policy.