淡江大學
Tamkang University

Syllabus

Prof. Der-Ming Ma, Ph.D.
E750, Engineering Building, Department of Aerospace Engineering
Tel: (02)2621-5656 ext. 3316; Fax: (02)2620-9746
E-mail: derming@mail.tku.edu.tw, Course Web Site：http://tsp.ec.tku.edu.tw/aerospace

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, Linear Algebra

Class: Class 2010, Aerospace Eng.

Lecture: Class A - Tue: 4:10 ~ 5:00 PM; Thu: 3:10 ~ 5:00PM; Class B - Tue: 5:10 ~ 6:00 PM; Thu: 1:10 ~ 3:00PM

Room: Class A – E508 (Tue), E405 (Thu); Class B – E508 (Tue), E405 (Thu).

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*, 11th ed., Pearson Education, Inc., 2007.   (Imported by 偉明圖書有限公司)

Course Schedule:

Week	Dates	Material covered
1st week	09/09, 09/11	Syllabus, Introduction to Control Systems.
2nd week	09/16, 09/18	Mathematic Methods of Systems
3rd week	09/23, 09/25	Mathematic Methods of Systems , State Variable Methods
4th week	09/30, 10/02	State Variable Methods, Feedback Control system Characteristics,
5th week	10/07, 10/09	Feedback Control system Characteristics, The Performance of Feedback Control Systems, 1st Exam (7:00~9:00 PM, 10/08, Wednesday),
6th week	10/14, 10/16	The Performance of Feedback Control Systems
7th week	10/21, 10/23	The Stability of Linear Feedback Systems
8th week	10/28, 10/30	The Stability of Linear Feedback Systems
9th week	11/04, 11/06	The Root Locus Method
10th week		2nd Exam (11/13)
11th week	11/18, 11/20	The Root Locus Method
12th week	11/25, 11/27	The Root Locus Method, Frequency Domain Method
13th week	12/02, 12/04	Frequency Domain Method, 3rd Exam (7:00~9:00 PM, 12/05, Friday),
14th week	12/09, 12/11	Frequency Domain Method
15th week	12/16, 12/18	Stability in the Frequency Domain
16th week	12/23, 12/25	Stability in the Frequency Domain., Design of Feedback Control System
17th week	12/30	Review, 01/01 The First day of 2009, National Holiday
18th week		4th Exam (01/08)

Grading Policy*:

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

Useful Links:

1. The MCS website: http://www.prenhall.com/dorf
2. Control Tutorials for MATLAB and Simulink (http://www.engin.umich.edu/class/ctms/)

---

* I reserve the right to change the policy.