

Contact Information:

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Text:

Modern Control Theory. Brogan, William L., 1990, ISBN: 0135897637, Prentice Hall,

Office Hours:

MWF 9:30-10:30, and by appointment. Feel free to try to resolve problems with email as well.

Objective:

To design and analyze control systems.

Course Webpage:

<http://www.pitt.edu/~jsv/courses/me2045/>

Computing:

The use of a computer and Matlab and the Controls Systems Toolbox will be integral to the class. A public computing cluster with Matlab on Windows NT and the Unix platform is available in Room 1075 Benedum Hall. You can purchase the Student Edition of Matlab from Mathworks:

http://www.mathworks.com/academia/student_version/ Another option is to run remoteX over a broadband connection. Also see the Controls Tutorial for Matlab developed by CMU and UMich at: <http://www.engin.umich.edu/group/ctm/>

Grading:

Midterm	30%
Final Exam	30%
Project	20%
Homework	20%

Tentative Syllabus:

Class:	Date:	Notes:	Topic:	Reading:
1	9/1/05		Overview/Modeling	Ch. 1&2, Notes
2	9/8/05		Classical Controls Review	Ch. 1&2, Notes
3	9/15/05		Classical Controls Review	Ch. 1&2, Notes
4	9/22/05		State Space Representation	Ch. 3-7
5	9/29/05		Linear Systems	Ch. 3-7
6	10/6/05		Cayley-Hamilton Theorem	Ch. 8
7	10/13/05		Analysis of State Equations	Ch. 9
8	10/20/05		Midterm Exam	
9	10/27/05		Stability	Ch. 10
10	11/3/05		Controllability and Observability	Ch. 11
11	11/10/05	At a conference...	Full-state Feedback Design Methods	Ch. 13
12	11/17/05		Observers	Ch. 13
13	11/24/05		Thanksgiving Break	
14	12/1/05		SID, Optimal and Robust Control	Ch. 13
15	12/8/05		Review, Take Home Final	

Potential References for this course:**MATH:**

- ◆ Schaum's Mathematical Handbook of Formulas & Tables. Spiegel, Murray R., 1998, ISBN: 0070382034, McGraw-Hill Companies, The

CLASSICAL CONTROL (FREQUENCY DOMAIN METHODS): Some are on reserve in the library.

- ◆ Feedback Control of Dynamic Systems. Franklin, Gene F., 1994, ISBN: 0201534878, Addison Wesley Longman, Incorporated,
- ◆ Modern Control Engineering. Ogata, 1996, ISBN: 0132273071, Prentice Hall,
- ◆ Control Systems Engineering, Nise, 3rd edition, 2000, John Wiley and Sons, Inc.

Linear Systems:

- ◆ Linear Systems. Kailath, Thomas, 1979, ISBN: 0135369614, Prentice Hall
- ◆ Linear System Theory and Design, 3/e (2nd edition is better), Chi-Tsong Chen, November 1998, Oxford University Press Inc, USA, ISBN: 0-19-511778-6

MATLAB:

- ◆ Mastering Matlab xxx. Hanselman, Duane C.; Littlefield, Bruce C., Prentice Hall,

References beyond this course:**OPTIMAL (MULTIVARIABLE) CONTROL:**

- ◆ Linear Quadratic Control. Dorato, Peter; Abdallah, Chaouki; Cerone, Vito, 1994, ISBN: 0023299622, Prentice Hall,

ROBUST (MULTIVARIABLE) CONTROL:

- ◆ Multivariable Feedback Control. Skogestad, Sigurd; Postlethwaite, Ian, 1996, ISBN: 0471943304, John Wiley & Sons, Incorporated,
- ◆ Robust Linear Control, Green, Michael; Limebeer, David J., Prentice Hall Books, June 1994, 0131022784

SYSTEM ID AND MODELING:

- ◆ System Identification. Ljung, Lennart, 1998, ISBN: 0136566952, Prentice Hall
- ◆ Modeling of Dynamic Systems. Ljung, Lennart; Glad, Torkel, 1994, ISBN: 0135970970, Prentice Hall

If you have a disability for which you are or may be requesting an accommodation, please contact both me and Disability Resources and Services, 216 William Pitt Union, (412) 648-7890/(412) 383-7355 (TTY), as early as possible in the term. DRWS will verify your disability and determine reasonable accommodations for this course. DRWS website:

<http://www.drs.pitt.edu>