**MAE 4310**
**Spring 2007**
**T-TH 11:00-12:30**
**Woolf Hall Room 308**

**Instructor: David Hullender**

**Office: Woolf Hall 304B**

**Office Hours: T-TH 9:30 am-11:00 am and by appointment**

**Phone: Office (866) 684-0076**

**Mailbox: Box 19023**

**E-mail: hullender@uta.edu**

**Instructor WWW site:** http://maepro.uta.edu/hullender

**Course WWW site for reference notes:** www-woolf.uta.edu/mae4310
**Password**:

**Course Prerequisites: MAE 3319**

**Required Textbook:** ***Modern Control Systems*****, Dorf & Bishop, 10th Edition**

**Course Description:** Design of Control Systems

**Course Learning Goals/Objectives:** Application of MATLAB and other software tools for the design and analysis of dynamic systems including systems with feedback.

**Attendance and Drop Policy**: Class and exam attendance is mandatory. Reasons for absence from class must be documented in writing to the instructor. There are no make-up exams; an excused absence from an exam will result in one less exam being considered in the final grade computation. The Drop Policy is consistent with the University drop schedule; the student must be passing to receive a W/P.

# MAE 4310

## Spring 2006

### Tentative Lecture/Topic Schedule

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|---|---|---|
| Jan. | 16 | Examples of control systems, and laboratory demonstration of the effects of feedback on stability, Chapters 1 & 6. |
| | 18 | Linearization, Laplace transforms, transfer functions, eigenvalues & time constants, Chapter 2. |
| | 23 | Matlab, block diagrams, and state variables, Chapter 3 |
| | 25 | Math concepts continued |
| **Jan.** | **30** | **Exam #1 over MATLAB and math concepts**, closed book, no notes, and no programmable calculators. |
| Feb. | 1 | Open loop and closed loop transfer functions & steady state error, Chap. 4 |
| | 6 | Performance indices, Chapter 5 |
| | 8 | Performance indices continued |
| | 13 | Root Locus, Chapter 7 |
| | 15 | Root Locus continued |
| | **20** | **Exam #2** |
| | 22 | Root Locus continued |
| | 27 | System design using root locus, PID Controllers |
| **March** | **1** | **State space approach to achieving desired eigenvalues, Chapter 11** |
| | 6 | State approach to achieving desired eigenvalues, continued |
| | 8 | State variable approach to minimizing performance indices, Section 11.4 |
| | **13** | **Spring Break** |
| | **15** | **Spring Break** |
| | 20 | State variable approach to minimizing performance indices continued |
| | 22 | Observer Theory, Section 11.3 |
| | 27 | Frequency Response Techniques, Chapter 8 |
| | 29 | Frequency Response Techniques, continued |
| April | 3 | Stability in the frequency domain: phase margin & gain margin, Chap. 9 |
| | **5** | **Exam #3** |
| | 10 | Lead and lag controller design, Chapter 10 |
| | 12 | Lead and Lag controller design continued |
| | 17 | Implementation of control with digital computers, Chapter 13 |
| | 19 | Implementation of control with digital computers continued |
| | 24 | Design problem |
| | 26 | Design problem |
| May | 1 | Review |
| | 3 | Review |
| **May** | **8** | **Final Exam 11 am – 1:20 pm** |

**Specific Course Requirements s/Descriptions**

**Quizzes:** Possible, count as homework
**Examinations:** All exams are comprehensive, closed book, and no programmable calculators are allowed.
**Homework**: Under normal circumstances, accepted only on the day that it is due. Students should make a copy of their work for reference before turning it in.
**Missed Exams & Quizzes:** See Attendance and Drop Policy

**Course Evaluation & Final Grade**: The final average will be a weighted average of homework (25%) , exams (55%), and final exam (20%)

**Student Evaluation of Teaching**: Forms will be handed out during the last two weeks of the semester.

**Americans With Disabilities Act**
The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112-The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act – (ADA), pursuant to section 504 of The Rehabilitation Act, here is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide **"reasonable accommodation"** to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with **informing faculty at the beginning of the semester and in providing *authorized* documentation through designated administrative channels.**

**Academic Dishonesty**
It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspensions or expulsion from the University.

"Scholastic dishonesty includes but is not limited to cheating, plagiarism collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22)

**Teaching Assistant and Schedule:** TBA