

## MEEN 3230.002 – System Dynamics and Controls 3 hours Spring 2016

### Instructor:

Dr. Mark Wasikowski  
Office: TBD

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Office Hours: by appointment

TuTh 7-8:20 PM, Room: NTDP B140

### Required Text:

System Dynamics and Control for UNT  
Nise, Wiley, 2105, ISBN-13: 978-1-11915-597-3

**Pre-requisite:** MATH 3410 Differential Equations 1

**Pre-requisite:** MEEN 2240 Programming for MEE (MATLAB)

**Catalog Course Description:** Review of basic modeling techniques of the dynamic behavior of mechanical and electrical systems. Linear dynamics. Block diagrams. Feedback and compensation. Computer simulations of steady-state and dynamic behavior. Root locus and frequency response methods. Vibrations analysis, control and suppression.

**Course Objectives:** Upon successful completion of this course, students will be able to:

- Demonstrate ability to model mechanical and electrical systems.
- Determine transfer functions.
- Learn to develop state-space models of mechanical systems.
- Demonstrate ability to perform computer simulation of control systems.
- Be able to perform stability analysis and root locus techniques.
- Gain ability to perform vibration analysis.

**ABET Criteria:** MEEN 3250 addresses the following ABET program outcomes: a) Apply knowledge of mathematics, engineering and science; b) Design and conduct experiments to verify and validate the design projects they develop and analyze and interpret the data; e) Identify, formulate and solve engineering problems; j) Achieve knowledge of contemporary issues; k) Use techniques, skills and computer-based tools for conducting experiments and carrying out designs; l) Apply principles of engineering, basic science, and mathematics to model, analyze, design, and realize physical systems, components, or processes in both thermal and mechanical systems areas

**Topics to be Covered (topics may or may not be covered depending on time available):** Modeling in the Frequency Domain, Modeling in the Time Domain, Time Response, Stability, Steady-State Errors, Root Locus Techniques, Design via State-Space Representation, Frequency Response Techniques.

**Course Format:** “Chalk-n-Talk lecture style”, occasional ppt, group discussion and problem solving. Cell phones will not be allowed during quizzes and exams. Extensive use of Blackboard for communication, grading, etc.

### Grade Evaluation:

Homework:	10%	A – 90-100%	No curve. A final average of 90.00 or higher is an A; 89.8 is a B. Exam/quiz re-grade requests must be made day returned. Once class dismissed requests not accepted.
Quizzes	20%	B – 80-89%	
Exam 1; 2/16	20%	C – 70-79%	It should be noted that entire quiz/exam will be re-graded, which may result in a lower score than originally assigned. Make-ups only for University-excused absences, given at semester end. Documentation required.
Exam 2; 4/5	20%	D – 60-69%	
Final; 5/5 (early)	30%	F - < 60%	

### Assignments/Quizzes:

Homework problems assigned often and due the following week. Late homework not accepted. Homework turned in to office not accepted. **There will be several quizzes. Lowest one is dropped. Make-up quizzes are NOT allowed.**

**Disability Policy:** Reasonable accommodation will be made to facilitate special needs. If special accommodations are required, student must meet with Office of Disability Accommodation (ODA), (940) 565-4323. After that meeting, please contact me to discuss what accommodations will be necessary. For more information, see <http://www.unt.edu/oda>.

### Academic Dishonesty:

Each student is expected to complete his/her own work. Cheating of any kind on the quizzes and exams will not be tolerated and will result in a score of zero for that assignment.