

MECH 3140: SYSTEM DYNAMICS AND CONTROLS

Spring 2012

Instructor: Dr. David M. Bevly (Wiggins 2418F)

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Email: bevlydm@auburn.edu (only if I am on travel – not for asking HW questions or announcements made in class)

Office Hours: MW 11-3 (if door is open or other times door is open)

Textbook: Palm, W., “System Dynamics,” 2nd Edition

Supplemental Text: Ogata, K., “System Dynamics,” 4th Ed., Prentice-Hall Publishing, 2004.
Franklin, Powell, Emami, “Feedback Control of Dynamic Systems”
Beginning MATLAB for Engineers, S. J. Reeves, College House Enterprises, LLC, 2001, 20 pp.

Course Website: <http://www.eng.auburn.edu/~dmbevly/mech3140/>

Pre-Requisites: MECH 2120; MATH 2650.

Grading Policy:

1.	2 semester exams (2 X 15 points)	30
2.	Matlab Assignments	10
3.	Pre-Requisite Quiz	5
4.	Projects (mid –5, final – 10)	15
5.	Quizzes	15
6.	Final Exam (Comprehensive)	25
	Total	100

Scale:

90-100 - A	70-79 - C
80-89 - B	60-69 - D
Below 60 - F	

Note you must work problems 2-3 hours per day in order to succeed in this class. Do not get behind as everything in this class builds on itself and it is impossible to catch up. The final exam will be comprehensive as the class is quite comprehensive in nature. This is a challenging class, but one you should look forward to applying your engineering knowledge and capabilities gained to this point in your career.

Tentative Lecture Topic Outline (Subject to Change)

<u>WEEK</u>	<u>TOPIC</u>
1	Laplace Transform and Transfer Functions
2	Modeling Mechanical Systems
3	Continued
4	Modeling Electrical Systems
5	Linearization
6	First Order Time Response
7	First Order Frequency Response
8	Second Order Time Response
9	Continued
10	Second Order Frequency Response
11	Higher Order Systems
12	Block Diagrams and PD Control
13	Continued (and Control Design Rules)
14	Integral Control and Root Locus
15	More on Root Locus (Lead/Lag), Conclusion and Review

Tentative Schedule for Exams

Exam 1: ~2/15 (night exam)

Exam 2: ~3/21 (night exam)

Final Exam: May 3 @ 8:00 AM (from course schedule bulletin)

Homework and Quizzes

Suggested homework problems will be given but not collected. Quizzes will be given (unannounced) to measure the understanding of the homework problems. Occasionally, the homework problems will include a “MATLAB” problem that will be collected and graded. Students *should not expect* (and will NOT) be successful in this class with out dedication toward reading the notes and book, as well as working homework problems!

General Policies

Class attendance is expected but not *formally* recorded. Late submission of assigned work or make-up examinations will be allowed if and only if accompanied by an approved University excuse. Additionally, I expect a very high standard of honesty among students at Auburn University as I feel that engineers with moral integrity is of the utmost importance in society. Because of the importance of academic honesty to the reputation of Auburn Engineers, I will report violations of academic honesty as outlined in the Auburn Tiger Cub. **This includes plagiarism of software! Additionally, answers which do not show the necessary steps will not receive credit!**

Accessibility

It is the policy of Auburn University to provide accessibility to its programs and activities, and reasonable accommodations for persons defined as having a disability under Section 504 of the rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act of 1990. Students who need special accommodations should make an appointment to see the instructor as soon as possible or contact The Student with Disabilities Program office at (334) 844-5943 (Voice/TT)