

**ECE-205 Dynamical Systems
Winter 2009-2010**

**Dr. Bob Throne
x-8414, Room D-221**

GRADING POLICY

Each of Three Exams	13%
Final Exam	26%
Labs	10%
Homework	10%
Matlab/Simulink	5%
Quizes	10%

Notes:

- (1) You must have a passing average (greater than or equal to 60%) on the exams to pass the class!
- (2) Homework assignments are **due at the beginning of class on Thursday**. No late homework will be accepted without prior approval.
- (3) You must acceptably complete each lab to pass the class.
- (4) Many of the homework problems will require you to use Matlab or Simulink as part of the problem. If you do not do these parts of the problem, do not expect to receive credit for any parts of the problem.
- (5) You are expected to do your own work. You can certainly talk with each other and help each other, but the work you hand in should be your own. As an example, if two people hand in the same Simulink plot and both came from the same directory, neither will receive any points!
- (6) Unless specifically told otherwise on a particular problem, you are expected to work out the problem by hand (or use Matlab). *If you write on your assignment that you used Maple and are copying the answer, expect to get no points.* You can use Maple to check your answers. You cannot turn in any Maple code or plot as part of the solution to a problem.
- (7) While each exam (except the final) will focus on material since the previous exam, you are responsible for all previous material. *Anything covered from the beginning of class up until the time of an exam is fair game for the exam.*
- (8) In general, I will give you answers to problems, but **I will not hand out or post solutions**. If you have questions or cannot get the correct answer, you need to come and see me. Your homework solutions will be your primary source for reviewing material before each exam, so it is very important that you do the homework.

Quizzes:

Most weeks we will have a quiz, usually (though not always) on Thursday. Usually before the quiz a “practice quiz” will be posted to give you an idea of the kinds of problems you are expected to be able to solve on that week’s quiz.

Labs:

For the most part, each person will turn in their own lab work. You can help each other out, but each person is responsible for doing and understanding the lab. We will use Simulink, Matlab, and MobilStudio each week, so plan to bring your laptops to lab each week.

(Very Tentative) SYLLABUS

Class 1 (11/30) – First Order Circuits

Class 2 (12/1) – Time Constants, Static Gain

Class 3 (12/3) – Solving First Order Differential Equations

Lab 1 - Concept Inventory, Simulink and Response of First Order Systems

Class 4 (12/7) – Second Order Circuits, Standard Form

Class 5 (12/8) – Solving Second Order Differential Equations

Class 6 (12/10) – Response of Underdamped Systems

Lab 2 – Response of First and Second Order Circuits

Class 7 (12/14) – System Properties: Linearity, Time-Invariance

Class 8 (12/15) – System Properties: Causality, Memoryless, Invertible

Class 9 (12/17) – **Exam 1**

Lab 3 – Response of Second Order Mechanical Systems

Class 10 (1/4) – Impulse and Unit Step Functions

Class 11 (1/5) – Impulse Response

Class 12 (1/7) – Convolution

Lab 4 – Approximately Linear Systems

Class 13 (1/11) – Convolution Examples

Class 14 (1/12) – Laplace Transforms

Class 15 (1/14) – Laplace Transforms of Circuit Elements

Lab 5 – Fourier Series and Autonomous Functions in Matlab

Class 16 (1/18) – Transfer Functions, Impulse Response, Poles and Zeros

Class 17 (1/19) – Partial Fractions

Class 18 (1/21) – **Exam 2**

Lab 6 – Transfer Functions, Pole-Zero Plots

Class 19 (1/25) – Characteristic Modes, Initial and Final Value Theorems

Class 20 (1/26) – Second Order Systems and Pole Locations

Class 21 (1/28) – Block Diagrams

Lab 7 – Feedback Systems

Class 22 (2/1) – Feedback Systems

Class 23 (2/2) – Steady State Response to a Periodic Input

Class 24 (2/4) – Steady State Response to a Periodic Input

Lab 8 – Feedback Systems

Class 25 (2/8) – Bode Plots

Class 26 (2/9) – Bode Plots

Class 27 (2/11) – **Exam 3**

Lab 9 – Experimental Construction of Bode Plots

Class 28 (2/15) - Bode Plots

Class 29 (2/16) – Filter Types, Bandwidth, Q of a Filter

Class 30 (2/18) – Gain and Phase Margins

Lab 10 - Bode Plots, Bandwidth, and Q of Systems