

**ECE-205 Dynamical Systems  
Winter 2011**

**Dr. Bob Throne  
x-8414, Room C-206**

**GRADING POLICY**

Each of Three Exams	12%
Final Exam	24%
Labs	10%
Homework	10%
Matlab/Simulink	5%
Quizes	10%
Lab Practical	5%

**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. **You will only be allowed to use calculators on the first exam.**
- (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.

**Quizes:** Most weeks we will have a multiple choice answer 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 weeks 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 Mobile Studio each week, so plan to bring your laptops to lab each week. Labs memos will be e-mailed to me, along with any necessary code as an attachment. You will be required to have your lab signed off by me before you send me the memo, so I can be sure your lab is working appropriately.

## ECE-205 SYLLABUS

Class 1 (11/28) – First Order Circuits

Class 2 (11/29) – Time Constants, Static Gain

Class 3 (12/1) – Solving First Order Differential Equations

*Lab 1 - Concept Inventory, Introduction to Simulink and Matlab*

Class 4 (12/5) – Second Order Circuits, Standard Form

Class 5 (12/6) – Solving Second Order Differential Equations

Class 6 (12/8) – Response of Underdamped Systems

*Lab 2 - Introduction to Mobile Studio, Time Constants, Settling Time, Percent Overshoot*

Class 7 (12/12) – System Properties: Linearity

Class 8 (12/13) – System Properties: Linearity

Class 9 (12/15) – System Properties: Time-Invariance, Causality

*Lab 3 – Time Domain Modeling of One Degree of Freedom Mechanical Systems*

Class 10 (12/19) – System Properties: Memoryless, Invertible, BIBO stability

Class 11 (12/20) – **Exam 1**

*Break*

Class 12 (1/5) – LTI Systems, Impulse Response

*Lab 4 – System Linearity and a Common Emitter Amplifier*

Class 13 (1/9) – Convolution

Class 14 (1/10) – Convolution Examples

Class 15 (1/12) – BIBO Stability, Causality, Interconnected Systems

*Lab 5 – Lab Practical*

Class 16 (1/16) – Laplace Transforms of Circuit Elements

Class 17 (1/17) – Transfer Functions, Impulse Response

Class 18 (1/19) – **Exam 2**

*Lab 6 – Transfer Functions, Optical Communications*

Class 19 (1/23) – Poles and Zeros, Partial Fractions

Class 20 (1/24) – Partial Fractions

Class 21 (1/26) – Partial Fractions

*Lab 7 – Simulation of Feedback Control Systems in Matlab and Simulink*

Class 22 (1/30) – Characteristic Modes, Asymptotic Stability, Initial and Final Value Theorems

Class 23 (1/31) – Block Diagrams, Feedback Systems

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

*Lab 8 – Implementation of a Feedback Control System*

Class 25 (2/6) – Computing  $H(j\omega_o)$  from the Pole-Zero Diagram

Class 26 (2/7) – Bode Plots

Class 27 (2/9) – **Exam 3**

*Lab 9 – Experimental Construction of Bode Plots*

Class 28 (2/13) - Bode Plots

Class 29 (2/14) – Bode Plots

Class 30 (2/16) – Filter Types, Bandwidth of a Filter

*Lab 10 – Lowpass, Highpass, and Bandpass Filters*