

**ECE-205 Dynamical Systems  
Winter 2013**

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

**Dr. Yong Kim**  
x -8216 , Room D-202

**GRADING POLICY**

Exams (8%, 14%, 14%)	36%
Final Exam	24%
Labs	10%
Homework	15%
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 generally ***due at the beginning of class on TUESDAY***. On weeks with exams, homework will be generally due on Tuesday or Wednesday. No late homework will be accepted without prior approval.
- (3) You must acceptably complete each lab to pass the class.
- (4) Some 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 **we will not hand out or post solutions**. If you have questions or cannot get the correct answer, you need to come and see us. 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 Tuesday. 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:** Each person will turn in their own lab work. You can certainly help each other out, but each person is responsible for doing and understanding the lab. We will use Simulink, Matlab, and Diligent EE boards each week, so plan to bring your laptops. Labs memos will be e-mailed to us, along with any necessary code as an attachment. *Labs are generally due at the end of the day on your lab day. Labs turned after 5 PM the next business day will have their grade reduced by 50%. Labs turned in after 5 PM two business days after their lab day will be given a 0. If there are extenuating circumstances let us know.*

## ECE-205 SYLLABUS

Class 1 (12/2) – First Order Circuits

Class 2 (12/3) – Time Constants, Static Gain

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

Class 3 (12/5) – Solving First Order Differential Equations

Class 4 (12/9) – Second Order Circuits, Standard Form

Class 5 (12/10) – Solving Second Order Differential Equations

*Lab 2 - Introduction to Diligent EE Boards, Time Constants, Settling Time, Percent Overshoot*

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

Class 7 (12/16) – System Properties: Linearity

Class 8 (12/17) – System Properties: Linearity

*Lab 3 – Second Order Systems and Fourier Series*

Class 9 (12/19) – **Exam 1**

### **Break**

Class 11 (1/6) – System Properties: Time-Invariance, Causality

Class 10 (1/7) – System Properties: Memoryless, Invertible, BIBO stability

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

Class 12 (1/9) – LTI Systems, Impulse Response

Class 13 (1/13) – Convolution

Class 14 (1/14) – Convolution Examples

*Lab 5 – Lab Practical*

Class 15 (1/16) – Convolution Examples

Class 16 (1/20) – BIBO Stability, Causality, Interconnected Systems

Class 17 (1/21) – Laplace Transform of Circuit Elements

*Lab 6 – Transfer Functions, Optical Communications*

Class 18 (1/23) – **Exam 2**

Class 19 (1/27) – Transfer Functions, Impulse Response

Class 20 (1/28) – Poles and Zeros, Partial Fractions

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

Class 21 (1/30) – Partial Fractions

Class 22 (2/3) – Characteristic Modes, Asymptotic Stability, Initial and Final Value Theorems

Class 23 (2/4) – Block Diagrams, Feedback Systems

*Lab 8 – Implementation of a Feedback Control System*

Class 24 (2/6) – Steady State Response to a Periodic Input

Class 25 (2/10) – Computing  $H(j\omega_o)$  from the Pole-Zero Diagram

Class 26 (2/11) – Bode Plots

*Lab 9 – Experimental Construction of Bode Plots*

Class 27 (2/13) – **Exam 3**

Class 28 (2/17) – Bode Plots

Class 29 (2/18) – Bode Plots

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

Class 30 (2/20) – Filter Types, Bandwidth of a Filter