



Autumn Quarter 2007

Department of Electrical and Computer Engineering

ECE 352: Systems II Call Number: 10405-5

8:30 AM – 9:18 AM, MWF, 0120 Baker Systems Engineering Building (BE)

Catalogue Description:

Laplace transform; frequency response and Bode plots; Z-transforms; state variables, state equations; computer-aided analysis.

Credit: 3 U 3cl.

Course Prerequisites: ECE 351 and ECE 301

Prerequisites by Topic:

Linear systems and models; computer-aided analysis; convolution and impulse response for discrete and continuous time; Fourier series and Fourier transforms.

Textbook: *Fundamentals of Signals and Systems Using MATLAB*, Third Edition, by Edward W. Kamen and Bonnie S. Heck, Pearson Prentice-Hall, 2007.

Instructor: Jose B. Cruz, Jr., 752 Dreese Laboratory, 292-1588, cruz@ece.osu.edu, <http://www.ece.osu.edu/~cruz>

Office Hours: 3:30-4:30PM, MTWRF.

Teaching Assistant: Xu Wang, 457 Dreese Laboratory, wang.807@osu.edu

Office Hours: 2:30-3:30PM, TRF

Course Objectives:

1. Teach fundamental concepts of continuous-time and discrete-time system theory. (Criterion 3(a)).
2. Apply theory to engineering problems (Criterion 3(a), such as systems modeled with linear differential equations and linear difference equations (Criterion 3(e)).
3. Illustrate applications in control systems (Criteria 3(a), (c), (e)).
4. Teach time domain techniques (state variables for continuous and discrete-time systems) and frequency domain techniques (Laplace and Z-transforms), emphasizing tools which can be implemented in analysis and design (Criterion 3(c)) via the computer package MATLAB (criterion 3(k))

Grading: homework (15%), quizzes (25%), midterm exam (25%), and final exam (35%).

Policies:

1. There will be 7 homework problem sets assigned via the Carmen web site and due on Mondays (see schedule) at the beginning of the class. The two lowest grades will be dropped. Solutions will be posted on the Carmen web site shortly after each set is due..
2. There will be 6 10-minute quizzes, given on 6 Wednesdays (see schedule). The lowest grade will be dropped. The tests will be closed book and no notes. Solutions will be posted on the Carmen web site shortly after each quiz.
3. There will be one midterm exam given on a Friday (see schedule). The exam will be closed book, but one 8.5 by 11 sheet of notes will be allowed for the exam. Solutions will be posted on the Carmen web site shortly after the exam.
4. The final exam will be closed book but two 8.5 by 11 sheets of notes will be allowed.
5. Any dispute of grades on tests must be brought up within 2 weeks of the return of the graded item.
6. You will be able to view all your scores for homework, quizzes, midterm exam, and the final exam on the Carmen web site.

ECE 352 Course Schedule for Au 2007

Class	Date	Topics	Readings: textbook sections
1	9/19	Laplace transform and its properties	6.1, 6.2
2	9/21	Computation of inverse Laplace transform	6.3
3	9/24	HW 1 due Transform of input/output differential equation	6.4
4	9/26	Quiz 1 ; Nth order case	6.4
5	9/28	Transform of input/output convolution integral	6.5
6	10/1	HW 2 due Direct construction of transfer function	6.6
7	10/3	Quiz 2 Transfer functions of block diagrams	6.6
8	10/5	Analysis of continuous-time systems	8.1, 8.2
9	10/8	HW 3 due Analysis of step response	8.3
10	10/10	Quiz 3 Response to sinusoidal inputs	8.4
11	10/12	Frequency response function; Bode diagrams	8.5

12	10/15	HW 4 due Causal filters	8.6
13	10/17	Practice Quiz (not graded); Review	
14	10/19	Midterm Exam	
15	10/22	Introduction to control	9.1
16	10/24	Tracking control	9.2
17	10/26	z-transform and discrete-time systems; properties	7.1, 7.2
18	10/29	HW 5 due Computation of inverse z-transform	7.3
19	10/31	Quiz 4, Inverse z-transform	7.3
20	11/2	Discrete-time system transfer function representation	7.4
21	11/5	HW 6 due Transfer functions, continued	7.4
22	11/7	Quiz 5, DT System analysis using transfer functions	7.5
23	11/9	DT system transfer functions, continued	7.5
	11/12	Veterans' day, no class	
24	11/14	State representation	11.1, 11.2
25	11/16	Continuous-time state equations; solutions	11.3
26	11/19	HW 7 due Solutions of state equations, continued	11.3
27	11/21	Quiz 6 Discrete-time systems state models and solutions	11.4
	11/23	Columbus day, no class	
28	11/26	Discrete-time state model solutions	11.4
29	11/28	Review of major concepts in the course	
30	11/30	Review	
	12/3	Final Exam, 7:30 am - 9:18 am in Room 0120 BE	