spring 2010

CALIFORNIA STATE UNIVERSITY, FULLERTON
DEPARTMENT OF ELECTRICAL ENGINEERING

EG-EE 420   Introduction to Digital Filters (3 units)

Instructor: Dr. M. Shiva	Telephone 278-3023
Office: E 218	Secretary 278-3013
office hrs MW 3-4 and after class.	E-mail mshiva@fullerton.edu

Prerequisites: EG-EE 409

Text: Digital Signal Processing, Oppenheim & Schafer, Prentice Hall.

References: 1. The Theory and Application of Digital Signal Processing,   *good reference Book. (hamsit)*
Rabiner and Gold, Prentice Hall.

Week	Subject	Text Pages & Homeworks
1	Discrete-Time Signals and Systems *will be on exams* — an arbitrary sequence, linear systems, shift-invariant systems, convolution, causality & stability, linear-constant-coefficient difference equations, examples	6 - 18 H.W. 1
2	2-Sided Difference Equations one sided difference equations Z-transform, inverse Z-transform solution of 2-sided difference equations one sided Z-transform solution of one sided difference equations frequency-domain representation of discrete-time signals and systems, examples	18 - 21
3	Fourier Transform for a Sequence frequency response of a systems symmetry properties of the Fourier transform (F.T.) sampling of continuous-time signals	22 - 30 H.W. 2
4	Comparison of Continuous and Discrete F.T. Properties steady-state response, sampling function, interpolation, Z-transform, region of convergence	45 - 52 H.W. 3
5	Inverse Z-transform residue theorem, partial fraction expansion	52 - 57 H.W. 4
6	Properties of Z-Transform system function, geometric approach	58 - 73 H.W. 5

Week	Subject	Text Pages & Homeworks
7	Discrete Fourier Transform (DFT) discrete Fourier series (DFS) ----- **Test #1** -----	87 - 91
8	Review of Test #1 properties of DFS sampling the Z-transform, DFT and its properties	91 – 105 H.W. 6
9	Circular Convolution linear convolution using DFT	105 - 115 H.W. 7
10	Flow-Graph & Matrix Representation of Digital Networks IIR systems, FIR systems, frequency sampling	136 - 162
11	Digital Filter Design Techniques design of IIR filters ----- **Test #2** -----	195 - 198
12	Review of Test #2 impulse invariant design, bilinear transformation, Butterworth filter	198 - 214 H.W. 9
13	Design Examples (Impulse Invariant & Bilinear Transform) frequency transform of low-pass IIR filters, geometric approach, design of FIR filters using windows	214 - 245 H.W. 10
14	Computer Aided Design frequency sampling design	225 - 255
15	Examples	

COURSE GRADE:

Test #1	30%	Test #1	25%
Test #2	30%	Test #2	25%
Final	40%	HW	10%
		Final	40%

Course Grade will be assigned on curve
+/- grading option will be used

FINAL EXAM: _____

one of HW problems are in exams.

mathematical Test for Continuity: Cauchy Rieman.

Make up exam: There are no make up exams. Missing a midterm test results in zero score for that exam. If a written proof for a legitimate reason for missing the test (such as a doctor's letter) is presented, the score of the exam will be assigned to the remaining tests. An excused absence from the final exam will result in an incomplete grade.

Academic Dishonesty: Cheating or plagiarism is considered a gross violation of the University's academic standards and is subjected to discipline. Please see UPS 300.021 on school's web-site

Disabilities: Students with disabilities are entitled to accommodations for documented special needs. Information about students' right to such accommodations can be obtained via the Disabled Student Service Office, UH 101, (714) 278-3117 or at at www.fullerton.edu/disabledservices/ .