

**Klipsch School of Electrical and Computer Engineering
College of Engineering
New Mexico State University**

**EE 395: Introduction to Digital Signal Processing, 3.0 Credits
Fall 2008**

Class Schedule: MWF 1:30-2:20 PM

Class Location: Thomas & Brown, Rm 304

Exclusive Lab Hours: MWF 12:30-1:30, TTh 4-5, T&B Room 206

Instructor:

Dr. Charles (Chuck) Creusere

Room 160D Goddard Hall

Phone: 646-3919

email: ccreuser@nmsu.edu

Office hours: W 9-11; by appointment (recommended).

Course Description:

This is an undergraduate course in digital signal processing. Topics to be covered here include sampling/reconstruction, LTI discrete-time systems, discrete-time Fourier and z-transforms, digital filter design and realization, and DSP applications.

Prerequisites: EE311 or equivalent (Signals and Systems)

Textbook:

S.K. Mitra, *Digital Signal Processing: A Computer-Based Approach*, 3rd Edition, McGraw-Hill, August 2006, ISBN: 0-07-286546-6

Other Useful References (not required):

S.J. Orfanidis, *Introduction to Signal Processing*, Prentice Hall, 1996, ISBN: 0-13-209172-0.

A. Gilat, *MATLAB: An Introduction with Applications*, ISBN 0-471-69420-7.

Software:

MATLAB, Signal Processing Toolbox (available in T&B 206). Purchase of MATLAB is optional.

Online Resources: WebCT

Course Objectives:

After completing this course, the student should be comfortable with the theory and practice of digital signal processing including:

1. Sampling and Reconstruction,
2. Discrete-time signals and systems (review)
3. Transform-domain analysis,
4. Designing and implementing FIR and IIR filters
5. Introduction to selected DSP applications through Matlab-based miniprojects
6. Students must also research and write an essay dealing with how DSP has been in some real-world application or situation, and critically analyze the problem with respect to the ethical and societal implications.

Contributions of EE395 to Meeting the Professional Component

Introduction to DSP is the undergraduate foundation course in DSP within the Electrical Engineering curriculum and is considered an engineering topics course in the Professional Component. Students in EE395 will apply techniques learned in class through assigned homework, software development, and in-class discussions. Techniques learned in this class will provide students with a broadening of their knowledge base to see applications of basic mathematics and engineering science techniques to the processing and analyzing of signals in the digital domain, provide preparation for capstone design projects, and provide a basis for future employment or educational advancement. The class provides 3 credits of engineering science credit.

Relationship of the Course to Program Objectives

Course Objective	Program Outcome					
	I b	II e	II f	III a	III f-III j	III-k
1		x	x	x		
2		x	x	x		
3		x	x	x		
4	x		x	x		
5	x		x	x		x
6					x	

Relevant Program Outcomes

- I b. Use of computers.
- II e. Knowledge of advanced mathematics.
- II f. Knowledge of engineering sciences.
- III a. Ability to apply knowledge of mathematics, science and engineering.
- III.f. Understand professional and ethical responsibly
- III.g. Ability to communicate effectively
- III.h. Broad education necessary to understand the impact of engineering solution in a global and societal context.
- III.i. Recognition of the need for and the ability to engage in life- ling learning
- III.j. Knowledge of contemporary issues
- III k. Use of engineering tools.

Grading:

Homework: There will be weekly homework assignments consisting of textbook problems and/or computer simulation projects. Worth 15% of the final grade. Late assignments will not be accepted. Solutions will be available on the class website.

Quizzes: There will be weekly on-line quizzes most weeks using the WebCT system. In total, they will be worth 15% of the final class grade.

Miniprojects: These are practical DSP assignments that will be given out periodically. They will be worth 20% of the class grade in total.

Exams: There will be two midterm exams worth a total of 30% of the final grade. There will be no makeup exams except in the case of serious documented illness. The exams will be held on the following dates: Friday, Oct. 3, 2008 during class and Friday, Nov. 7, 2008 during class. If you have any professional conflicts with these dates, you must contact me at least 2 weeks in advance to arrange to take the exam early. Makeup exams will only be given with proof of medical illness.

Final: The final, comprehensive examination is scheduled for Monday, December 8, 2008 from 1:00-3:00PM. It is worth 20% of the final grade. *Student will have the option of replacing the numeric score of one midterm with that of their final.*

Re-grading: If a student feels that the grading on any assignment or exam is in error, they must bring the problem to the instructor's attention **within 1 week** of receiving the graded assignment and solutions.

Calculating Final Grades: Final grades will be calculated either on an absolute scale or using the clustering methodology explained in class--whichever is more beneficial to the student. Letter grades will not be assigned for individual exams.

Policies:

You may discuss homework and programming assignments with either myself, the TA, or your peers. This discussion could include among other things, various approaches to a homework problem, algorithms for a software project, programming tips, and various theoretical insights. Be aware, however, that all submitted solutions to homeworks and projects must be written or coded (in the case of software) by the individual. There is to be no "sharing" of solutions. **Any plagiarism or cheating will result in an automatic F in the course.**

Exam Calculator Policy: Only dumb calculators of the sort certified for the FE Exam will be allowed on exams in this class. This includes the HP 30s, TI-30Xa, and TI-30X IIS.

EEO/ADA Information:

Feel free to call Jerry Nevarez, Director of Institutional Equity, at 505-646-3635 with any questions you may have about NMSU's Non-Discrimination Policy and complaints of discrimination, including sexual harassment.

Feel free to call Michael Armendariz, Coordinator of Services for Students with Disabilities, at 505-646-6840 with any questions you may have on student issues related to the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act of 1973. All medical information will be treated confidentially.

Prepared by: C. Creusere, 08/15/07