CENG 5431 Digital Signal Processing

COURSE:	**CENG 5431 Spring 2015** MW 4:00 – 5:20 PM
INSTRUCTOR:	Dr. Thomas L. Harman
OFFICE:	D104 Phone: (281) 283-3774
OFFICE HOURS:	M 1:00-4:00pm, Evenings after 7PM (Check lab D125 or office)
PREREQUISITES:	Graduate standing and CENG 5131 or equivalent. Material to know is signal sampling, spectrum analysis using the FFT, etc.
DESCRIPTION:	This course will cover the fundamentals of Digital Signal Processing using MATLAB as the software for selected homeworks. We will first cover analog filter design and then explore digital systems and the design of digital filters.
TEXTS:	The textbook *Analog and Digital Signal Processing* by Ambardar is a modern and readable text to introduce analog and digital signal processing. Try Amazon for a great price on a used book. *Digital Signal Processing* By Steven W. Smith, Ph.D. A book you can buy or download free on the WEB. http://www.dspguide.com/ch1.htm
COURSE FORMAT:	The course presentations will be mainly lectures. In addition to regular homework and examinations, problem solutions and plots using the MATLAB software are required. Reference: *Advanced Engineering Mathematics Using MATLAB*, by Harman, et. al., PWS (Brooks Cole)
GRADING:	The grade will be divided as follows:

Midterm & Final Exam or Project	60%
Homework	30%
Class Participation & Quizzes	10%

The homework will consist of problems of an analytical nature. The programs and plots are to be done using MATLAB unless other arrangements are made to use another software package (i.e. Maple, etc.).

Dates for examinations, etc. will be discussed in class.

1. Last day to withdraw from course (this is a university prescribed date and can be found in the semester schedule)
2. Attendance policy: If you must miss a class, send me an e-mail. I will hold the handouts for that class for you until the next class.

3. Academic honesty policy

The Academic Honesty Policy at UHCL (found in the University of Houston-Clear Lake Catalog) states:

a. Academic honesty is the cornerstone of the academic integrity of the university.
b. It is the foundation upon which the student builds personal integrity and establishes a standard of personal behavior.

Because honesty and integrity are such important factors in the professional community, you should be aware that failure to perform within the bounds of these ethical standards is sufficient grounds to receive a grade of "F" in this course and be recommended for suspension from UHCL.

The Honesty Code of UHCL states "I will be honest in all my academic activities and will not tolerate dishonesty."

4. Special academic accommodations (as specified by the Americans with Disabilities Act)

If you will require special academic accommodations under the Americans with Disability Act, Section 504, or other state or federal law, please contact the Disability Services Office at (281) 283-2167.

HOMEWORK RULES
Robotics, Control, DSP, Adv. Math, etc.

10- POINTS FOR EACH DAY LATE
Unless you e-mail me with a legitimate excuse

PLEASE Turn in a paper copy at the beginning of the class

For all Problems: (-10 points if violated)

1. **Briefly describe the problem to be solved before attempting the solution.**
2. **Show all work.**
3. **Turn in problems in order**
4. **Make the results clear (Circle answers, explain results, etc.)**
5. **When an explanation of the results is requested, the numerical solution will not be sufficient.**

MATLAB Problems (-10 or more if violated)

1. **Write the equations to be solved**
2. **Describe the solution method (flowchart, description, etc)**
3. **Comment the MATLAB code**
4. **Turn in the code and the results (Plots, etc.)**

Be Neat – if I cannot read the solution – no credit!!

CENG 5431 *Spring* Course Outline

Digital Signal Processing Dr. T. L. Harman

Introduction	Review of DSP Applications	HW1
Data Acquisition Systems:		
Sampling and Quantization	Sampling, aliasing, and reconstruction	
Filtering	Analog Filters	
Spectrum Analysis and DFT	Brief review	
Discrete Equations and z transforms	Applications to signal processing	
Digital filters	Design methods	
MATLAB Examples	The Signal Processing Toolbox -	
Practical Examples	DSP and audio; DSP and control, etc.	

(Note: MATLAB will be used throughout the course for verifying computed results and plotting.)

Learning Outcomes

Program and Document Problems using MATLAB Signal Processing toolbox software.

Learn and apply signal processing methods to Analog systems

Learn and apply signal processing methods to Discrete systems

Understand which techniques apply to analog systems and which to digital systems and compare and contrast the methods

Design digital filters and apply to various signals

Accommodations (as specified by the Americans with Disabilities Act) - Suggested statement: If you will require special academic accommodations, please contact the Disability Services Office at 281-283-2627.

Academic Honesty Code: see section 2.1.4 in this handbook for the UHCL Academic Honesty Code.