Syllabus for
EE 450—Digital Signal Processing (Special Topics)
3 Credit Hours
Spring 2004

I. COURSE DESCRIPTION

Introduction to the theory and application of digital signal processing, DSP. Design of digital filters using DSP technology. Application of software tools in the design of filters.
Prerequisite: EGR 210
Course fee: $35.

II. COURSE GOALS

To enable the students to have a firm foundation in basic signal processing and its applications.

III. COURSE OBJECTIVES

As a result of successful completion of this course, the student will be able to do the following:

A. develop methods for processing discrete-time signals. These signals include waveforms that originate as discrete time signals as well as those that originate from sampled continuous time signals.

B. understand the process of analog-to-digital and digital-to-analog conversions.

C. acquire some familiarity with digital filters in terms of design and implementation and become familiar with the effect of filters on signals.

D. understand discrete Fourier transform (DFT).

IV. TEXTBOOKS

Required Textbooks

McClellan, James H., Schafer, Ronald W. and Yoder, Mark A.; Signal Processing First; Pearson Education, Inc., Pearson Prentice Hall, Upper Saddle River, NJ 07458; 2003

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University.
2. Double cuts will be assessed for absences immediately preceding or following public holidays.

3. Excessive absences can reduce a student's grade or deny credit for the course.

4. Students taking a late exam because of an unauthorized absence will be charged a late exam fee.
5. Students and faculty at Oral Roberts University adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, video, multimedia, or computer software.
6. The final examination cannot be given before the scheduled time. Students need to check the schedule of the final examination themselves before planning return flights or other events at the end of the semester.

B. Course Policies and Procedures

1. Assessment Criterion

Homework	15%	
Project	15%	
Exam 1		20%
Exam 2		20%
Final exam	30%	
Total	100%	

2. Handouts, etc

Lecture handouts and homework assignments cannot be scheduled in advance. They will be distributed and announced during each lecture. If a student misses a class, the relative information must be obtained from his/her classmate who attended the class. The instructor will neither loan his notes nor give an individual repeat of the lecture.

3. Homework:

The primary way to acquire the working knowledge of the material in this course is to do as many hands-on exercises as possible. A certain amount of homework, if any, will be assigned at the end of each lecture and will be due at the beginning of the following lecture. No late assignments will be accepted. Assignments from those who are absent without any valid reason will not be accepted. Your work should be neat and follow the recommended format below.

Given: List out the necessary information given by the question;
Solve for: State what is to be determined;
Solution: Explain all the symbols used and show detailed workings about how the solution is obtained.

4. Academic Honesty:

The students are strongly encouraged to work out the solutions of the homework on their own. Discussions in doing the homework are permissible. But copying homework solutions from classmates is considered dishonest and is absolutely forbidden. Dishonesty in an exam, if detected, will lead immediately to a failing grade for the course and will be reported to the Dean of Arts and Sciences.

5. Attendance:

The students are expected to be punctual for class. It will incur one absence for every two times they are late. The first three absences from the lecture

will not result in a grade reduction. Each absence thereafter will result in a 1% grade reduction in the final score (10% maximum). The absences allowed prior to grade reduction are designed to accommodate emergencies and illnesses but not for indiscriminate use. The final score will be increased by 1% for perfect attendance.

VI. COURSE CALENDAR AND TOPICS

Topic		**Lectures**
Chapter 1.	Introduction	1
Chapter 2.	Sinusoids	1
Chapter 3.	Spectrum Representation	2
Chapter 4.	Sampling and Aliasing	3
Chapter 5.	FIR Filters	3
Chapter 6.	Frequency Response of FIR Filters	3
	Examination I	
Chapter 7.	z-transforms	3
Chapter 8.	IIR Filters	3
Chapter 9	Continuous-Time Signals and LTI Systems	4
Chapter 10.	Frequency response	3
	Examination II	
Chapter 11.	Continuous-Time Fourier Transform	2
Chapter 12.	Filtering, Modulation, and Sampling	4
Chapter 13.	Computing the spectrum (DTFT, DFT, FFT)	4
	Project	**3**
	Final Examination	

Dr. Daobin Zhang
Name of Instructor

EE 450
Course No.

Digital Signal Processing
Title of Course

Engineering & Physics
Name of Department

MISSION

The lifestyle at ORU is rooted in the word "Wholeness." ORU seeks to educate whole persons with balanced emphasis placed on the development of mind, spirit, and body.

GENERAL OUTCOMES

1. Spiritual Development
2. Physical Development
3. Communication
4. Analysis
5. Problem Solving
6. Valuing in Decision-making
7. Social Interaction
8. Global Perspectives
9. Effective Citizenship
10. Aesthetic Responsiveness

MAJOR OUTCOMES

Analysis/Problem Solving: Have the ability to analyze, design and obtain effective solutions to real world engineering and physical problems.

Communication/Team Work: Demonstrate the ability to work in team and communicate effectively in written and oral forms.

Fundamental Knowledge Base: Possess fundamental knowledge of principles of engineering, physical sciences and mathematics.

Christian Stewardship and Ethics: Ethically apply engineering technology to the solution of human problems using Christian principles.

COURSE OUTCOMES

1. **Analysis**: Enable the processing of discrete-time signals.
2. **Fundamental Knowledge Base**: Facilitate the understanding of A/D and D/A conversions and their applications in DSP. Enable the usage of DFT and FFT.
3. **Problem solving**: Enable the student to design digital filters for various applications.

ASSESSMENT OF COURSE GOALS

STIMULI:

Exams	3
Assignments	8
Project	1

CRITERIA:

Mini and Final Examinations: 70%

Homework and Project: 30%