University of North Texas, College of Engineering  
Department of Electrical Engineering

EENG 5610: Digital Signal Processing  
Spring 2017  
Tuesdays and Thursdays 2:30 - 3:50 PM  
Classroom: B217

Instructor

• Dr. R. Thomas Derryberry, Office: NTRP A154, Tel: (940) 565-4324  
  Email: tom.derryberry@unt.edu  
  Office Hours: Tuesday and Thursday, 1:30 – 2:30 PM  
  (Additional appointments can be requested by email.)
• TA: Oghenetega Agbogidi (Tega), E-mail: OghenetegaAgbogidi@my.unt.edu  
  Office Hours: 1:00 – 2:30 PM Won, Wed, Fri, Room B245

Course Description

• Introduction to modern digital signal processing theory and techniques. Includes discrete time  
  signals and systems, sampling theorem, Z-transform, frequency analysis of signals and systems,  
  discrete Fourier transform, fast Fourier transform algorithms, and digital filter design.

Prerequisites

• EENG 2620 or equivalent

Course Webpage

• All the course related material will be posted on the course webpage which is available through  
  blackboard (https://learn.unt.edu).

Course Objectives

By the end of the course, you will learn

• Basic theories of digital signal processing;
• Analysis and design of digital signal processing systems and computational techniques.

Required Textbook

  Author: John G. Proakis and Dimitris G. Manolakis, Publisher: Pearson Education, Inc.  
  ISBN: 0-13-187374-1
• Supplemental text: MATLAB 7 R14 Student Edition.
Course Requirements and General Policies

- Class attendance is mandatory. Lectures and class discussions will contain vital information needed to do well on the exams.
- Everyone must turn in individual homework. Homework must be done individually (you will learn the most from this). Any evidence of group participation or simply copying other's homework will be treated will be interpreted as academic dishonesty.
- Please remember to turn off phones prior to class. Please note that portable phones, pagers, and late arrivals are disruptive to the instructor and to your peers. The use of cell phones, beepers, or communication devices is disruptive and is therefore absolutely prohibited during class or while taking exams or quizzes. Turn off your cell phone while in class. If I catch you using these devices, your final grade will be reduced by 10% for each and every transgression and you will be asked to leave the class. Except in emergencies, students using such devices must leave the classroom for the remainder of the class period. I know that some of you may wish to take notes directly on your computer and I have no problem with that. If however, you choose to access your email, search the web, play games, or instant messenger your friends during class, you will have 5% deducted from your final grade for each and every transgression. This penalty will be at the sole discretion of the instructor. If for some reason I am late arriving to class, it will be because of circumstances beyond my control. You are expected to remain for 15 minutes past the scheduled class start time while I attempt to communicate my situation and relay instructions.
- Please do not wait until the last minute. If you are having trouble with this class, please stop by my office during my office hours. I am also available by email.
- Please visit http://www.unt.edu/csrr for your rights and responsibilities.

Disability Accommodation

- The University of North Texas (UNT) complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. UNT provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation (http://www.unt.edu/oda) at 940-565-4323 during the first week of class. It is the responsibility of students with certified disabilities to provide the instructor with appropriate documentation from the Dean of Students Office.

Assignments, Quizzes, and Exams

- No late assignments will be accepted and no emailed assignments will be accepted, except in extenuating circumstances. Homework is due before the class in the following week.
- Exams will be based on textbook readings, handouts, class exercises, class lectures and discussions, and homework assignments. Students are responsible for all text material, regardless of whether we review the text material in class or not.
Secret to Success in this Course (Shshsh, don’t tell anyone!)

- To do well in this course, you should be thoroughly familiar with this material. However, several years of research and practice including many trial and error attempts have resulted in the development of this long sought after but elusive recipe to success. The best kept secret to achieving success in this course is cordially shared with you below:
  1. Read and comprehend the required text (Yes, you have to read!).
  2. Know and explain how to correctly solve the homework assignments independently.
  3. Know and explain how to correctly solve the programming assignments independently.
  4. Arrive on time, engage in, and practice active listening for all of the class lectures.
- By the way, there are rumors this recipe works very well when applied to other courses.

Grading Policies

- There will be no extra credits.
- You MUST achieve PASSING PERFORMANCE for BOTH Parts 1 and 2 of the course grading in order to PASS the course, i.e. your grades for Parts 1 and 2 will not be merged together to yield a composite course score without FIRST achieving passing performance for both Parts 1 and 2 separately. Failure to achieve passing performance in either Part 1 or Part 2 will result in a final course grade of F.

<table>
<thead>
<tr>
<th>PART 1</th>
<th>PART 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Programming Assignments</td>
<td>10%</td>
</tr>
<tr>
<td>Final Project</td>
<td>10%</td>
</tr>
<tr>
<td>Totals</td>
<td>40%</td>
</tr>
</tbody>
</table>

- Keep all of your graded assignments, quizzes, and tests for study and review. You should track your own progress using Blackboard or other appropriate means and be aware of current grades throughout the term however the official gradebook will be my Excel spreadsheet. I will make all the effort to return the graded assignments, but it’s your responsibility to collect back the graded assignments from the grader or the instructor if it is not given back to you. A composite course score will be computed only for those students that achieve passing performance for both Part 1 and Part 2 of the grading assessment. Failure to achieve passing performance in either Part 1 or Part 2 will result in a final course grade of F. Once passing performance has been achieved in BOTH Parts 1 and 2 of grading, the final grading for the composite (merging of Part 1 and Part 2 grading) course score will be done as follows: A > 90%, 90% > B > 80%, 80% > C > 70%, 70% > D > 60% and F < 60%. Grades will be curved if deemed necessary. Grades cannot be changed after they have been electronically entered into the university’s system except for instructor error. Any extenuating circumstances that may adversely affect your grade must be brought to my attention before the final course grades are recorded. To be considered, such circumstances must be unusual, unavoidable, and verifiable.
Academic Dishonesty

- All the provisions of the University code of academic integrity apply to this course. In addition, it is my understanding and expectation that your signature on any test or assignment means that you neither gave nor received unauthorized aid. For homework and lab assignments, while discussion is allowed, direct copying is not and students must turn in individual submissions. Realize that mastery of the material in the homework and lab assignments will be essential for a good performance on the exams! All students are required to know, observe and help enforce the UNT Code of Student Academic Integrity. Cheating will result in disciplinary action according to UNT Policy 18.1.16. The penalty for a first offense can range from a formal warning to an ‘F’ for the course. Regardless of the penalty imposed, a record of the offense will be kept in the Office of the Dean of Students.

Course Outline and Tentative Schedule

All course materials, including syllabus, lecture notes, homework assignments, and grades are available in Blackboard Learn at https://learn.unt.edu/

- **First Day of Class, Jan. 17, Tuesday, 2:30 - 3:50 PM**
  - Course Introduction;
  - Class 1: Introduction to Signals, Systems, and Signal Processing
  - Class 2: Discrete-time signals and systems
  - Class 3: The z-Transform and Its Applications
  - Class 4: Frequency Analysis of Signals
  - Class 5: Frequency-Domain Analysis of Systems
  - Class 6: Sampling and Reconstruction of Signals
  - Class 7: Discrete Fourier Transform
  - Class 8: Implementation of Discrete-Time Systems
  - Class 9: Design of Digital Filters
  - Class 10: Multirate Digital Signal Processing (Time permitting)
- **Final Exam, May 9, Tuesday, 1:30 - 3:30 PM**

Useful Links

- UNT Catalogs: [http://www.unt.edu/catalog/](http://www.unt.edu/catalog/)
- Office of the Registrar: [http://essc.unt.edu/registrar/](http://essc.unt.edu/registrar/) (schedule of classes and exams, etc.)
- Eagle Student Services Center: [http://essc.unt.edu/](http://essc.unt.edu/)
- Blackboard Learn: [https://learn.unt.edu/](https://learn.unt.edu/)

*Last updated: 01/11/2017*