
ECE 4670/6670 Section 400 (online section)
Course Title – Introduction to Digital Signal Processing

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Office Hours: 3:30 pm - 4:30 pm Tues., Wed., and Thurs.

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Course Description

Introduction to characteristics, design, and applications of discrete time systems; design of digital filters; introduction to the Fast Fourier Transform (FFT); signal processing applications. Preq: [ECE 3300](#) (or equivalent) with a C or better.

Course Objectives

At the completion of the course, students should be able to:

- demonstrate a thorough understanding of the fundamentals of digital signal processing
- design and realize different classes of digital filters using a variety of design techniques
- use MATLAB tools to design and analyze digital filters
- interpret and apply the outputs of the Discrete Fourier Transform
- implement the DFT using the FFT algorithm

Required Materials

Textbook: *Fundamentals of Digital Signal Processing* by Lonnie C. Ludeman

Topical Outline (and approximate number of lectures on each topic)

- I. Introduction (1)
- II. Review of Discrete-Time Systems (4)
- III. Review of Applying the Z-Transform to Discrete-Time Signals and Systems (4)
- IV. Analog Filter Design (3)
- V. Digital Filter Design (8)
- VI. Realizations of Digital Filters (1)
- VII. The Discrete Fourier Transform (4)
- VIII. Application Examples (1)

Grading

QUIZ 1	20%	Tuesday, 9/25/2018
QUIZ 2	20%	Tuesday, 10/23/2018
QUIZ 3	20%	Tuesday, 11/20/2018
HOMEWORK	15%	
FINAL EXAM	25%	Mon., 12/10/2018 (3:00 p.m.- 5:30 p.m.)

(If the Final Exam grade is higher than at least one of the three Quiz grades, the lowest Quiz grade will be replaced by the Final Exam grade.)

Note: An extra assignment will be required for students enrolled in ECE 6670. This extra assignment will involve a MATLAB project or a review of paper involving an application of DSP. The grade for this extra assignment will count for one-half of the overall homework grade for ECE 6670 students.

GRADING SCALE: for ECE 4670: A: 85 – 100 B: 75 - <85 C: 60 - <75 D: 50 – 60 F: 0 - <50
for ECE 6670: A: 85 – 100 B: 75 - <85 C: 60 - <75 F: 0 - <60

Online Lectures

Lectures will be presented in the form of video files which will be posted on the university's Canvas system. Students can view these at their convenience, but should stay on schedule on a weekly basis.

Homework

Homework assignments and solutions will be posted weekly on Canvas. Students will scan their solutions and send them as email attachments to the grader.

Late Homework Policy

No homework will be accepted after the due date. However, the lowest two homework grades will be dropped.

Quizzes and Final Examination

The quizzes and final exam can be taken remotely under the supervision of a proctor approved by the professor. Quizzes and the final exam must be taken at the scheduled date and time shown above.

Quiz/Exam Proctors

The function of the proctor is to ensure that the student works independently and follows the rules for the quiz or exam. The proctor scans the student's completed quiz and sends it by email to the instructor. The student recommends a proctor for approval by the instructor. (More information about selection of proctors will be posted on Canvas.)

Interaction with Professor for Online Class

Email will be checked daily by the professor for questions. Phone calls can also be scheduled as needed. The student is expected to check the Canvas page for this course at least every other day, since lectures, homework, homework solutions, quiz solutions, and other course material will be distributed via Canvas.

The policies in this syllabus are general policies common to all courses in ECE. Course specific information will likely be included in a separate, course specific syllabus. **Students are responsible for reading and understanding the information in both this common syllabus and in the course specific syllabus.**

The syllabus is subject to change based on extenuating circumstances or at the instructor's discretion. **In the event that there is a conflict or discrepancy between the common syllabus and course specific syllabus, the course specific syllabus overrides the common syllabus.**

Attendance

Unless otherwise stated on the course specific syllabus, **students are expected to attend class, and to arrive on time.**

In the event of an **emergency**, students should contact the course instructor, preferably before class or the exam. Students should speak with instructors regarding any scheduled absence as soon as possible and develop a plan for any make-up work, if allowed by the instructor. It is the student's responsibility to secure documentation of emergencies, if required by the instructor. A student with an excessive number of absences may be withdrawn at the discretion of the course instructor.

If the instructor is late, students are expected to wait 15 minutes for the instructor to arrive.

Any further attendance policies in place will be listed on the course specific syllabus, and will serve to supplement these policies.

Inclement Weather Policy

Any exam that was scheduled at the time of a class cancellation due to inclement weather will be given at the next class meeting unless contacted by the instructor. Any assignments due at the time of a class cancellation due to inclement weather will be due at the next class meeting unless contacted by the instructor. Any extension or postponement of assignments or exams must be granted by the instructor via email or Canvas within 24 hours of the weather related cancellation.

Academic Integrity

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a 'high seminary of learning.' Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form. In instances where academic standards may have been compromised, Clemson University has a responsibility to respond appropriately to charges of violations of academic integrity.

Further information on Academic Integrity can be found in the [Undergraduate Announcements](#) and in the [Graduate School Policy Handbook](#).

Access Accommodations

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if possible, but there could be a significant wait due to scheduled appointments. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here:

<http://www.clemson.edu/campus-life/campus-services/sds/>.

Anti-Harassment and Non-Discrimination

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Executive Director of Equity Compliance. Her office is located at 110 Holtzendorff Hall, 864.656.3181 (voice) or 864.656.0899 (TDD).

Online Courses

In an online course, you will interact with the content, instructor, and/or classmates on at least a weekly basis through course assignments, asynchronous discussions and/or synchronous sessions as indicated on the course specific syllabus. Further resources for online courses may be found here:

<http://www.clemson.edu/online/students/>.

Computing technology questions may be sent to ITHELP@clemson.edu.

Emergency Procedures

Emergency procedures have been posted in all buildings and on all elevators. Students should review these procedures for their own safety. Students are required to monitor their university email (see <https://www.clemson.edu/studentaffairs/student-handbook/universitypolicies/email-communications.html>) thus establishing this as a convenient method for official communication to students. Students are also encouraged to enroll in CU-Safe alerts. See <https://www.clemson.edu/cusafety> for more information.

Copyright Statement

Materials in some of the courses are copyrighted. They are intended for use only by students registered and enrolled in a particular course and only for instructional activities associated with and for the duration of the course. They may not be retained in another medium or disseminated further. They are provided in compliance with the provisions of the Teach Act. Students should be reminded to refer to the Use of Copyrighted Materials and “Fair Use Guidelines” policy in on the Clemson University website for additional information: <https://www.clemson.edu/library/>.