syllabus

GEORGIA INSTITUTE OF TECHNOLOGY
SCHOOL of ELECTRICAL & COMPUTER ENGINEERING
ECE 2026: Introduction to Digital Signal Processing (Spring 2025)

Lecturers:

Prof. Chin-Hui Lee, office: Centegy 5180
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Course Website: **https://canvas.gatech.edu/ (http://canvas.gatech.edu/)**
SPFirst Resource: **https://dspfirst.gatech.edu/ (http://dspfirst.gatech.edu/)**

Textbook: DSP First, 2nd Edition by McClellan, Schafer & Yoder, Prentice-Hall, ISBN-10: 0136019250, ISBN-13: 9780136019251

MATLAB student version **https://matlab.gatech.edu/ (http://matlab.gatech.edu/)**

Grading: Recitation 5% (Assigned by your recitation instructor)
Homework 20% (Written assignments, see homework policy below)
Lab 15% (Written assignments and in-class Q&A, see lab policy below)
Quiz #1 10% TBA
Quiz #2 10% TBA
Quiz #3 10% TBA
Final 30% TBA

In all cases we will at least follow the a basic traditional grading scale where: A=90-100; B=80-89; C=70-79; D=60-69; F=0-59. While in all cases a grade of 90-100 will be assigned an ‘A’, the boundaries for the other grades will be determined at the end of the semester based on the overall class performance. It is impossible to determine what the exact “cutoffs” will be for each grade but you can be assured that your assigned grade will never be lower than the “traditional” grading scale described above based on your final class average.

Academic Honesty:
All violations of the Georgia Tech Honor Code will be handled by referring the case directly to the Dean

of Students for investigation and penalties. Past infractions have included cheating on tests, copying lab
results, copying homework, and forging TA signatures. Additionally, you are not permitted to complete any in class exercises or attendance checks for another student other than yourself. Doing so will be considered a violation of the Georgia Tech Honor Code and be handled accordingly. As a reminder to students, violations of the Honor Code can be met with minimum drop of one letter grade in their final course grade and potentially academic probation.

Main Lectures:

Main lectures are held twice a week unless otherwise announced. See the weekly lecture schedule and slides at the class website on Canvas. The purposes of main lectures are to inform students of the
broad view on topics that are being covered each week. Videos along with the corresponding lecture notes will be posted before scheduled classes. Ideally, the main lectures should motivate each topic and
introduce the major components involved in developing a deeper understanding of the course material. Personal interactions will be carried out during the scheduled classes through mostly Q&As. Attendance is expected and a critical part of performing well in the course. More interactions are expected during the recitation sessions. Do bring your questions to these occasions and participate actively there.

Recitations (times vary, held in person or online, check your registered schedule):

Recitations are held each week unless otherwise announced. See the weekly recitation schedule at the class website. The purpose of recitation is to answer questions and facilitate a deeper and more personal interaction with an instructor on the course content. Ideally, recitations are student led in that the instructor functions to assist students in the areas they feel most challenging. Attendance is expected at each recitation. If you must miss a recitation session for any reason, you MUST contact your instructor before the session with a valid excuse, or you will get an absence mark for the missed session. You can also schedule and attend another session in the same week. The instructors will be responsible for 5% of your grade. Do discuss grading expectations with your recitation instructor.

Laboratory (times vary, held in person or online, check your registered schedule):

The labs will meet online once per week unless otherwise announced. There is no lab in the first week of classes (week of 1/6-1/10). See the lab schedule on the lab page of the class website. The laboratory explores hands-on applications of the course concepts using MATLAB. It is a critical component of the course. There will be approximately six written lab reports, including corresponding codes and plots, compiled into a single pdf file. Check CANVAS Assignments for submission instructions.

Homework:

Written homework will be assigned (approximately) weekly and will be due on Friday of the assigned week (unless otherwise specified). For help, check the course website for office hours with instructors. Solutions will be posted for all HW assignments. Late homework will not be accepted. There will be approximately 12 written homework assignments. Check CANVAS Assignments for submission instructions.

Intelligent Tutoring System (ITS):

In addition to written homework assignments, we will also be using the intelligent tutoring system (ITS) (https://its.vip.gatech.edu/faq/), which is an online system that reinforces your understanding of basic concepts. There will be approximately 8 online ITS exercises scored automatically to assess your concept understanding, but not counted towards your homework grade. However, you are encouraged to practice the ITS questions especially at the time when you prepare for quizzes and exams. You are also welcome to bring related questions to the quiz review sessions and office hours for discussions.

Absences:

Class attendance is expected. Institute policy on absences for illness or personal emergencies may be found at:
http://www.catalog.gatech.edu/policies/student-absence-regulations/ (http://www.catalog.gatech.edu/policies/student-absence-regulations/) .
For illnesses, students are responsible for providing the documentation to the Office of Student Life where it will be treated and handled confidentially with necessary information being submitted to the students instructors for that term. If you must miss class due to a personal emergency then you should contact the office for the dean of students at (404) 894-6367 or fill out a form requesting assistance at:
https://studentlife.gatech.edu/content/class-attendance (https://studentlife.gatech.edu/content/class-attendance) .
The Dean of Students will then verify the personal emergency with your instructors. If you have an institute approved activity that will cause you to miss class, then you must provide an institute approval letter by filling out the form at: **https://registrar.gatech.edu/node/97 (https://registrar.gatech.edu/node/97)** . When properly documented, any of the instances above will constitute an excused absence and you should inform Prof. Lee (chl@ece.gatech.edu) and your recitation instructor of the absence without providing any confidential information. If your absence involves missing an exam, you must coordinate a means of grade replacement with Prof. Lee. In most circumstances, the grade for the exam you missed will be calculated based on your performance in the following exams to be taken later. Usually, no exam makeups are scheduled.

Office of Disability Services:

If you are a student registered with the Office of Disability Services (ODS), please make sure the appropriate forms and paperwork are completed by Prof. Lee and your recitation professor within the first week of classes. The instructors will abide by all accommodations required by ODS. The schedule for exams is posted in the syllabus and any potential modifications or changes will be made with at least one week's notice. It is the responsibility of the student to properly arrange test accommodations for each exam with ODS in sufficient time to guarantee space for exam administration. ALL exam accommodations must be handled through ODS. If the student does not register accommodations with ODS for the taking of an exam, then they will have to take the exam at the normally scheduled times without any additional accommodation unless the instructor is given specific directive from ODS on the students behalf due to a mitigating circumstance.

Office Hours:

At this time of writing, times and locations for office hours are still being worked out; this information will be posted on the class website. You are welcome to go to anyone's office hours.

Student Collaboration:

Students are encouraged to study together for homework, lab problems and exams to openly discuss course topics. However, each assignment that is turned in must reflect the work of each individual student. No copying of work from other students in (or out) of this class is allowed and such activity would represent a violation of the Academic Honor Code. If you are not certain of the nature of a student collaboration you are involved in, please feel free to contact Prof. Lee, or your recitation instructor for their expectations.

Teacher Commitment:

All of the instructors and graduate teaching assistants commit to dedicating our time and energy to ensure that you have a productive learning environment for this course.

Student Commitment:

As the student, you agree to commit your time and energy to learn the material by completing all assignments in a timely manner, attending all class sessions, and seeking help when you require it.

Course Description:

Introduction to signal processing for discrete-time systems. Sampling Theorem. Filtering. Frequency response. Discrete-Time Fourier Transform. Discrete Fourier Transform. Z Transform. Laboratory emphasizes computer-based signal processing.

Additional Resources:

Extra course materials, including homework, demos, can be found in: **https://dspfirst.gatech.edu/ (https://dspfirst.gatech.edu/)** .

Course Outcomes:

Upon successful completion of this course, students should be able to:
(1) Express signal processing systems in mathematical form; (2) Write Matlab code describing a signal processing system; (3) Analyze signals in terms of their frequency content; (4) Describe system behavior in terms of frequency content; (5) Analyze linear system behavior in terms of Fourier transform and frequency response; (6) Analyze mixed analog-digital systems with sampling operations and digital filters; (7) Utilize the z-transform to analyze discrete-time systems in terms of poles and zeroes; (8) Use complex exponential notation to describe signals and systems; and (9) Describe how signal processing is used in applications (e.g., audio and digital image processing).