ECE 438 Digital Signal Processing Lab
Spring 2023
(Updated on January 09, 2023 at 11:02 PST)

TA Information

1. Antesh Antesh
   - aantesh@purdue.edu
   - Office Hours:
   - Monday: 2:30p – 3:30p (Virtual: https://purdue-edu.zoom.us/j/93898355331?pwd=MUViRE9ZVEI3am1ua3dZd2w1Y3VBUT09 **or** Meeting ID: 938 9835 5331, Passcode: 152952)
   - Thursday: 2:30p – 3:30p (BHEE 215)

2. Md. Adnan Faisal Hossain
   - hossai34@purdue.edu
   - Office Hours:
   - Tuesday: 2:30a – 3:20p (BHEE 215)
   - Wednesday: 11:30a – 12:20p (BHEE 215)

Lab Session

Lab Section #	Day: Time: Location	TA
2	Tuesday: 8:30a – 11:20a: BHEE 215	Antesh Antesh
3	Tuesday: 11:30a – 2:20p: BHEE 215	Md. Adnan Faisal Hossain
5	Thursday: 11:30a – 2:20p: BHEE 215	Antesh Antesh

Lab Content

The experiments in this course generally build upon material covered in lecture. Each experiment describes one or more theoretical concepts, and then presents exercises to implement the concepts in Python. All the lab content is directly relevant to the exercises, so it is important that each section be read and understood before performing the corresponding exercises. As a rule, the entire lab should be read before your section meeting. You will spend less time in the lab that way. If the lab work is not completed during the lab period, the remaining work should be done during open lab time or at home.

Week #	Lab #	Lab Title
1	Lab 01	Discrete and Continuous-Time Signals
2	Lab 02	Discrete-Time Systems

3	Lab 03	Frequency Analysis
4	Lab 04a	Sampling and Reconstruction of Continuous-Time Signals
5	Lab 05a	Digital Filter Design (Week 1)
6	Lab 05b	Digital Filter Design (Week 2)
7	Lab 06a	Discrete Fourier Transform
8	Lab 06b	Fast Fourier Transform Algorithm
9	Lab 07a	Discrete-Time Random Processes (Week 1)
11	Lab 8	Representation and Waveform Quantization
12	Lab07b	Discrete-Time Random Processes (Week 2)
13	Lab 09a	Speech Processing (Week 1)
14	Lab 09b	Speech Processing (Week 2)
15	Lab 10a	Image Processing (Week 1)
16	Lab 10b	Image Processing (Week 2)

Prerequisite

Programming experience

- Python is the main programming language used in the lab. Students who have little to no experience in Python might have difficulty doing ECE 438 labs.

Git and GitHub Account

- Students are expected to be familiar with some basic git commands (e.g., git pull, git commit, git push) to retrieve the lab material from the GitHub repo and submit their work in GitHub.
- By the beginning of the first lab, each student is required to create a GitHub account.
- Join GitHub here: https://github.com/join
- You may use either your Purdue email address or personal email address

Attendance

Students must attend every laboratory. If you need to miss a lab due to an academic/business trip, job interview, or illness you should notify your lab TA before the missing lab and should submit suitable documentation. There will be NO EXCEPTIONS! Students should finish or complete most part of each lab during their assigned lab session. At the end of the lab session, students should sign out from the computer in the lab (this is a must).

Laboratory Components

1. Weekly Quiz
   - 30% of total lab grade
   - 15 minutes to complete and 10 points per weekly quiz, which is based on the lab content of the previous week and the current week.

- Distributed at the beginning of the lab section.
- If a student is more than 10 minutes late for the quiz, they will NOT be allowed to take a makeup quiz without a valid excuse. The makeup quiz may be held during your TA's other lab section or by an appointment. Makeup quizzes can be held up to twice.
- There is no weekly quiz in Week 1.
- At the end of the semester, the lowest quiz grade will be dropped.

2. Laboratory Report
    - 70% of total lab grade
    - Lab reports are completed in the Jupyter Notebook.
    - By the beginning of each week, an email with a GitHub Classroom assignment invitation link will be sent to each student.
    - After the assignment is accepted, a private repository will be created, where the student can access the lab material.
    - To complete the lab students can use the computers available in BHEE215. However, from my experience the best way is to use your own personal machine or use the free Google Colab.
    - Students are encouraged (not required) to work on the lab reports in groups.
    - A group should consist of no more than two students and should be finalized during the first lab.
3. Submission
    - Each lab is due at the beginning of the next lab session before the quiz. Since, there is a week extension from the original lab date, no late submissions will be allowed.
    - Each student in the group is required to complete the individual report for each lab. The repository needs to be regularly updated before the deadline for TAs to check if the student is active in working on the lab.
    - The individual lab report will NOT be graded.
    - After all students in a group finish their individual lab reports, they need to collaborate to complete the final lab report.
    - The final lab report needs to be in PDF and submitted to Gradescope.
    - NOTE: There a ton of resources available online on how to convert a Jupyter Notebook to a pdf, please refer that. Use the one that best suits your needs.
    - The final lab report will be graded.
    - All students within a group will receive the same score for each lab.
    - IMPORTANT: To avoid confusion, every week 3 different submission folders will be created for students from the 3 lab sections, respectively. The following will be the naming of these Gradescope assignments: LAB_NAME_DAY_TIME, for eg. For week 1 Tuesday 8:30AM, the assignment name will be, Lab01_Tuesday_8:30AM. Please read the assignment name carefully before submission.

Cheating

Don't do it. Specifically, if you have access to a previously graded lab report, do not even look at it. Do not use someone else's code to perform the exercises. Some examples of cheating would be:

- Downloading large portions of code from the internet.
- Looking at another student's completed code.
- Writing code while looking at another person's code.
- Copying written work from others.
- Copying your lab partner's code.
- Submitting a report or code that includes someone else's work.
- Requesting a re-grade of a lab report that has been altered.
- Looking at another student's quiz.

Any kind of cheating will result in a failing lab grade. This would require the student to retake the lab in a subsequent semester. All occurrences of academic dishonesty will be reported to the Assistant Dean of Students and copied to the ECE Assistant Head for Education. If there is any question as to whether a given action might be construed as cheating, please see the professor or the TA before you engage in any such action.