ECE538 Digital Signal Processing I

Fall 2024

Information Sheet

Lecturer:	Professor Michael D. Zoltowski
Office:	MSEE 318
Telephone:	(765) 494-3512
FAX:	(765) 494-0880
e-mail Address:	michael.zoltowski@gmail.com (preferred) or mikedz@purdue.edu
recommended:	Piazza = great software tool for Q & A
course web site:	https://engineering.purdue.edu/˜ee538/
lectures:	posted at Brightspace
Office Hrs:	Primarily use Piazza but also by appt
Mailing Address:	Professor Michael Zoltowski (ATTN: ECE538)
	School of Electrical and Computer Engineering
	Electrical Engineering Building
	465 Northwestern Ave.
	Purdue University
	West Lafayette, IN 47907-2035

TA : TBA

Required Text: J.G. Proakis and D.G. Manolakis, *Digital Signal Processing: Principles, Algorithms, and Applications*, Prentice-Hall, NJ, Fifth Edition, 2022. (Fourth Edition is fine as well but note that the Fifth Edition can be view online for a nominal fee.)

Reference: Mathworks, *Student Edition of Matlab*, Prentice-Hall, NJ.

Scheduled Class Time (Live Lecture): MWF 12:30-1:20 pm in WANG 2599

Grade Breakdown:

3 Hour Exams:	60% (20% each)
Computer Projects:	15% (5% each)
Final Exam:	25%

Examination Dates:

Test 1:	September 30, online thru Brightspace
Test 2:	October 30, online thru Brightspace
Test 3:	December 2, take home thru Brightspace
Final:	TBD
Labor Day Break:	Sept. 2 (no class)
October Break:	Oct. 7-8 (no class on Oct 10)
Thanksgiving Break:	Nov. 27-30
Finals Week:	Dec. 9-14

Homeworks:

Regular homework will NOT be assigned. Your main homework is to work through my exams from past semesters. Solutions have been scanned in and posted at the course web site. Note: it is important that you attempt all the problems on past exams, as problem-solving is a key part of the learning process and helps one to keep abreast of the lecture material.

Relative to solving the problems on my old exams, you should do so without looking at the solutions in a timed setting. You can look at the solutions before and after attempting the exam, but it is important to work through them without looking at the solution. Some students ask for more homework problems out of the textbook, but I think the best homework, in terms of preparing for the exams, is to work through my old exams.

Matlab Assignments

There will be (at least) 3 assignments involving the use of a computer to simulate signals, perform cross-correlation, digital filtering, spectral analysis, digital subbanding, etc. Successful completion of these assignments will be worth 15% of your final grade. The assignments are not intended to be difficult from a programming standpoint, nor are they intended to be time consuming. Use of the Matlab software package greatly facilitates execution of these assignments. Note that I will do Matlab-based computer demos in-class on a regular basis. The code for these Matlab demos are posted at the course web site and may be used for any of the Matlab based assignments.

New **On-Campus** graduate students should see the ECN site specialist as soon as possible to get an account on the Engineering Computer Network (ECN) at Purdue. For **Off-Campus** students, if you do not have access to Matlab at work, you may consider purchasing the student PC version of Matlab which you can purchase on-line at The Mathworks Web Site. A new version of the Student Edition of Matlab was recently released that includes additional toolboxes (relative to previous releases.)

Course Web Site

The course web site is https://engineering.purdue.edu/~ee538/ There will be a variety of useful material and information posted at the course web site, including:

- general course information and announcements including syllabus, office hours, contact info., etc.

- scanned versions of the handwritten lecture notes in acrobat pdf format posted right after each live lecture

- Matlab script files used for in-class demos and accompanying audio or video files

- old exams with accompanying solutions scanned in acrobat pdf format

- Matlab script files facilitating the computer projects

- Matlab computer assignments in html and acrobat pdf format along with accompanying solutions scanned in acrobat pdf format

- Matlab script files facilitating the computer projects along with solutions to the computer mini-projects

Office Hours:

You are strongly encouraged to ask questions via the Piazza software, and I will respond as quickly as possible. There are many great things about Piazza. Every student gets to see the question and my answer, and can ask follow-up questions and add their own insights and observations. I can answer questions easily with equations (using Latex) and also append diagrams easily. In addition, I can answer questions at any hour of the day. Thus, Piazza will be the primary tool for office hours for me, but one can make Zoom appointments by email as well.

We will have a Teaching Assistant and I will ask the TA to hold regular office hours. **Again, you are strongly encouraged to send questions via the Piazza software too, and I will respond as quickly as I can.**

Make-Up Policy:

There will be three sixty minute examinations and a final two hour examination. The dates for the three hour exams are as indicated on this sheet and the *Course Syllabus.* The current plan is for the exams to be done online. The only question at this point is whether they will be multiple choice exams or workout problems. I will figure that out as soon as possible. The other question is how long of a window I have to leave the exam open for you all to take the exam.

For logistical reasons and in the interest of fairness to all students enrolled in the course, we must adhere to a strict policy regarding make-up examinations. If you miss an examination for any reason without my having agreed in advance to excuse you from it, assumed that missing the exam was due to extreme extenuating circumstances, you will not be allowed to make it up. Instead, your final exam score will count for that portion of your grade. **On-Campus** students who are enrolled as full-time students will not be allowed to make up an exam for any reason.

Relative to the above policy, it is assumed that a missed exam is the result of extenuating circumstances. You should make every attempt to contact me by phone prior to missing an exam (with email only as a backup.) If you miss an exam and were not able to contact me prior to the exam, you should get in contact with me as soon as possible and let me know why you were not able to take the exam. It is not acceptable to simply not take an exam and assume that the final will count for that portion of your grade. If you simply do not show up for an exam and do not have any valid reason for such, you will be given a zero for that examination.

Grade Disputes:

If you dispute your grade on any exam or computer assignment, you have *one week* from the date that the graded paper was returned to you to request a regrade. Please attach a brief note of explanation to your paper when you return it. Please hand all exam regrade requests to me. For computer assignments, first try the TA and the issue is not resolved, then bring it to me.

Lecture:

I would like to encourage active participation from the class as much as possible. Therefore, I encourage you to ask questions during the lecture. I will also be asking you some questions to stimulate your thinking at various points during the lecture.