Syllabus · MA 34900

Spring 2025

Lectures

Lectures will be face-to-face Monday, Wednesday, and Friday at 1:30-2:20pm in Helen B. Schleman Hall 302. You are expected to attend every lecture. Lectures will not be recorded; however, Dr. Hood will post her notes on the Brightspace page.

Communication

Questions about math content are best asked in person, either before or after class or in office hours.

Questions about grading, course policies, calendar, etc. can be asked in person or via email. In your email communications, please include the course title "MA 349" in the subject line. In the body, please address your professor by Dr. Hood. Where possible, please write succinct emails. If more information is needed, Dr. Hood will reply with follow-up questions. Here are some links with information about Emailing a Professor and Email Etiquette.

Instructors' Contact Information

Professor	E-mail	Office Hours	Office
Dr. Kaitlyn Hood	kthood@purdue.edu	Wed, Fri at 10:30am – 11:30am	MATH 844
		Thu 10:30am – 11:30am	Zoom: https://purdue-edu.zoom.us/j/98728999443

*Dr. Hood will answer emails between 9am – 5pm on weekdays and will do her best to respond within 2 business days.

Brightspace Page for MA 34900

Check the course Brightspace page (https://purdue.brightspace.com/) often for important information and announcements.

- All due dates for the semester are posted in Brightspace.
- Your grades will be posted in the Brightspace Gradebook.
- Any changes to the syllabus or important announcements will be posted to the Brightspace page under "Announcements".
- You can access instructions for using Brightspace at the following page under "Learner Resources": https://www.purdue.edu/brightspace/Documentation.php

Course Page for MA 34900

Some information on Brightspace will also be posted on Dr. Hood's personal website for this course: https://www.math.purdue.edu/~kthood/MA349_Spring2025.html

Course Calendar

The course calendar will be posted on the Brightspace page. The calendar is also posted online here: https://www.math.purdue.edu/~kthood/calendar_ma349_sp25.html

Any changes or adjustments to the schedule will be announced on the Brightspace page.

Textbook

The textbook for this course is: "Linear Algebra, Signal Processing, and Wavelets - A Unified Approach: MATLAB Version" by Øyvind Ryan, 2019, Springer. Online Access is available through Purdue Library.

You may also use the Python version of the textbook: "Linear Algebra, Signal Processing, and Wavelets - A Unified Approach: Python Version" by Øyvind Ryan, 2019, Springer. Library Link.

Course Outcomes

At the end of the course, you will be able to:

1. Describe and analyze continuous-time and discrete-time signals in different bases.

2. Understand the relation between a continuous-time signal and a sampling of that signal, including methods to reconstruct a continuous-time signal from its samples and applicability conditions.

3. Describe and analyze the properties of continuous-time and discrete time systems in different bases.

4. Construct linear and time-invariant systems to process continuous-time and discrete-time signals.

5. Write code to apply the Fast Fourier Transform, convolution, edge detection, denoising, and compression to signals and/or images.

In Class Participation

In class participation will be collected and graded via iClicker Cloud. Students must bring a mobile device (such as a phone, tablet, or laptop) to class in order to participate in the iClicker Cloud polls. Purdue University has a sitewide license for iClicker cloud, so it costs nothing for the students to use.

The Polls are designed to:

- Actively engage students during the entire class period
- Gauge students' level of understanding of the material being presented, and
- Provide prompt feedback to student questions. (Martyn, 2007)

There is "ample converging evidence" that clickers generally cause:

- Improved exam scores or passing rates,
- Improved student comprehension, and
- Improved learning. ([Caldwell, 2017](#))

Grading of the iClicker Cloud Polls will be as follows:

- The Poll Questions in each Class Session will be worth a total of 10 points:
  - **Participation Credit:** Students earn 5 points when they answer (correctly or incorrectly) at least 75% of the poll questions offered during that class session. For example, if there are four poll questions, a student must answer at least three polls to earn participation points. These answers do not need to be correct to earn the participation credit.
  - **Correctness Credit:** The remaining 5 points are graded on correctness and split evenly between the poll questions in that session. For example, if there are four poll questions in a class session, then each correct answer will be awarded 1.25 points.
- To accommodate both approved and unapproved absences, roughly 20% of the lowest scores of the Poll assignments will be dropped. (The exact number may change due to unforeseen circumstances, but 20% will be targeted).

To Login to iClicker Cloud:

- **https://student.iclicker.com**

- click on "Sign in through your campus portal" link at the bottom of the screen and log in with your Purdue Career Account login and password

Homework

There are weekly written homework assignments using *MyLab Math*. You can access *MyLab Math* through the Brightspace page.

- Homework is due weekly on Thursdays at 11:59pm.
- The lowest homework score will be dropped.
- You are allowed to use calculators, notes, books, and to consult peers, TAs, and tutors to complete the homework. Generative AI is allowed with proper acknowledgement (see section below). Your homework submission should reflect your own understanding.

Late Homework Policy

The lowest HW score will be dropped, but in return, late HW will not be accepted. Gradescope will not accept submissions after the deadline has passed. If an assignment is missed for reasons that are serious, unavoidable, and beyond the student's control, the situation will be handled on an individual basis. Documentation may be required in such cases.

Calculators

Calculators are not allowed in exams. You may use calculators for homework assignments.

Coding

Almost every homework assignment will require some coding. These will be small, proof of concept type problems. The process of converting mathematical expressions to workable code deepens your understanding of the course material.

You are welcome to use whichever coding language you are most familiar with (python, Matlab, C, etc). Since some students may have different coding experience, this course will allow students to use generative AI, such as ChatGPT, to help write code, with the expectation that students acknowledge when they use AI on an assignment (see section below for more details).

Generative AI Policy

Generative AI may be used on Homework Assignments in this class. AI can be helpful with coding, especially in a language you are not familiar with, however, there are some limits to what ChatGPT can do. Be aware that AI can also provide misleading or incorrect information. Use of AI can negatively affect your learning as they can offer shortcuts that reduce the need for critical engagement that is key to deep and meaningful learning.

Any HW that you submit should reflect your own understanding. It is important that you do not use AI tools to generate an answer and submit it as if it was your own work. Learning to use AI is an emerging skill, and there are some tutorials on how to use them.

Acknowledgements:

If you use AI, such as ChatGPT, you should acknowledge it in your HW. Below are some examples of acknowledgements.

- "ChatGPT was used to structure the code for question #3 on this HW assignment. I then edited and modified the code to answer the question. Here are the prompts that I used: …"
- "ChatGPT was used to turn pseudocode into python. I then debugged and tested the code to ensure that it worked and produced the correct output. Here are the prompts that I used: …"
- "ChatGPT was used to suggest an appropriate method for solving question #2. I then solved the question using the method by hand. Here are the prompts that I used: …"
- "ChatGPT was used to get a better understanding of this method. I used it to solve a similar problem to the HW. Then I solved the HW problem on my own. Here are the prompts that I used: …"

Be aware of the limits of ChatGPT, such as the following:

- If you provide minimum-effort prompts, you will get low-quality results. You will need to refine your prompts in order to get good outcomes. This will take work.

- Don't trust anything it says. If it gives you a number or fact, assume it is wrong unless you either know the answer or can check with another source. You will be responsible for any errors or omissions provided by the tool. It works best for topics you understand.

- Any content, ideas, or assistance obtained through AI tools must be appropriately cited, similar to any other reference or source. You will need to go and find the relevant citations from the

primary literature (i.e. journal articles). Be warned that ChatGPT tends to fabricate fictitious citations. Be sure to double check and read the original source.

- AI is a tool, but one that you need to acknowledge using. Please include a paragraph at the end of any assignment that uses AI explaining what you used the AI for and what prompts you used to get the results. Failure to do so is in violation of academic honesty policies.

- Be thoughtful about when this tool is useful. Don't use it if it isn't appropriate for the case or circumstance.

Prohibited Uses:

AI should not be used to complete the midterm exams or final exam, unless explicitly permitted by the instructor.

Accessibility:

All students must have equal access to AI tools. If a particular tool is used, it should be free of cost for all users. (For example, ChatGPT-3 is allowed since it is free to all users, but ChatGPT-4 is not since it requires a paid subscription)

Consequences for Misuse:

Misuse of AI tools in coursework, which includes but is not limited to producing unoriginal work, uncited use of AI-generated content, or unauthorized assistance on assessments, will be considered a breach of academic integrity. Consequences will follow Purdue's policies on academic dishonesty as detailed in this syllabus, which may include grade penalties, course failure, or more severe disciplinary actions.

Technical Problems

If you have technical problems with Gradescope, you should first read the documentation on the help center at https://help.gradescope.com/#. If that does not resolve the problem, you should contact help@gradescope.com.

It is your responsibility to maintain your personal computer in working order. In the case of a malfunction, there are many computer labs on campus that you can use to complete the homework.

If you lose your phone, you can request a Hardware Token (free of charge) to submit BoilerKey Two-Factor Authentication. More information at BoilerKey FAQ.

Exams

There will be two midterm exams and a final exam.

- The midterm exams will be in-person written exams. No calculators will be permitted.
- The midterms will take place during class time and are scheduled for the dates below:

Exam	Date	Time	Location
Exam 1	Mon, Feb 17	1:30 – 2:20pm	SCHM 302

| Exam 2 | Wed, Apr 2 | 1:30 – 2:20pm | SCHM 302 |

- You are not permitted to use calculators, books, notes, electronic devices, websites, or to consult a peer or any other person on the exams.
- Exam scores are final and there are no exam re-takes.

Final Exam
- The final exam will be comprehensive, and it will cover the material from the entire course.
- The date and time of the final exam has not yet been scheduled by the Registrar. The final exam information will be announced later in the semester.

Missed Exam Policy
If there are any special circumstances that may affect your ability to successfully complete an exam (illness, family emergency, conflict with another class at Purdue, etc.), you should discuss the situation with your instructor *before* taking the exam (if you are physically able to).

- In rare cases, students may be permitted to take a make-up exam.
  - This exam will be a different version from the in-person exam taken on the original date.
  - Make-up Exam dates and times are limited.
- If a student is sick at the time of the exam, the appropriate course of action is to schedule a make-up exam for when the student is feeling better. Once an exam is taken, it cannot be voided or retaken.

Grades

Course grades are determined from your overall total score using a percentage scheme according to the formula in the table below:

Graded Item	Percentage
In Class iClicker Polls	10%
Homework	20%
Two midterms @ 20% each	40%
Comprehensive Final Exam	30%

- You can check your running Total Score online in the Brightspace Gradebook. The Total Score percentage grades will not be rounded.
- Final letter grades will be determined using the following tentative grading scale:

Tentative Grading Scale

Letter	Percentage
A+	≥ 97%
A	93% - 96.9%
A-	90% - 92.9%
B+	87% - 89.9%
B	83% - 86.9%
B-	80% - 82.9%
C+	77% - 79.9%
C	73% - 76.9%
C-	70% - 72.9%
D+	67% - 69.9%
D	63% - 66.9%
D-	60% - 62.9%
F	< 60%

Will there be a curve?

- Homework Scores and Poll Questions will not be curved.
- At the end of the semester, the total class score will be calculated according to the formula above and a letter grade assigned.
    - For each of the grades in the Tentative Grading Scale, it's possible that at the end of the semester a somewhat lower percentage will be enough to earn that letter grade.

Attendance Policy

This course follows Purdue's academic regulations regarding attendance, which states that students are expected to be present for every meeting of the classes in which they are enrolled. Attendance will not be recorded, but you are responsible for all information, announcements, and course material that is presented in lectures.

Honors Contract Work

The student is to take the laboratory course MA34990: "Data Science Lab: Fourier" in the Spring 2025 semester. If the student does not earn a grade of D or above in MA34990, then their MA 34900 grade shall be reduced by one level. For example, if the MA 34900 grade would have been an A-, then the student shall receive a B+ in MA 349. If the student does get a grade of D or above in MA390, then their MA 34900 grade shall remain the same. Note that the grade penalty will be applied if the student drops MA34990.

Important Dates

Last day to drop a course without it on your record: **Monday, January 27th, 2025**

Last day to drop a course and receive a W: **Friday, April 18th, 2025**

Please see Spring 2025 Add/Drop Information for more details.

Academic Integrity

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern. More details are available on our course Brightspace under University Policies.

Nondiscrimination Statement

A hyperlink to Purdue's full Nondiscrimination Policy Statement is included in our course Brightspace under University Policies and Statements.

Accessibility

Purdue University strives to make learning experiences accessible to all participants. If you anticipate or experience physical or academic barriers based on disability, you are encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247.

If you have been certified by the Disability Resource Center (DRC) as eligible for accommodation, you should contact your TA to discuss your accommodation as soon as possible. You should send your Course Accessibility Letter (CAL) to your TA and to the professor. Here are instructions for how to send your course accessibility letter: https://www.purdue.edu/drc/students/course-accessibility-letter.php Accommodations will be implemented once the CAL is received. According to University policy, accommodations are not retroactive.

Students with disabilities whose DRC Course Accessibility Letter (CAL) includes test accommodations must first release their CAL to the instructor and then schedule to take their exams through the DRC at **olympic.accessiblelearning.com/Purdue**. While exams are scheduled through the DRC, the exams will be organized and proctored by the Undergraduate Math Office (UMO). You must schedule your exam at least one week before the exam date listed on the syllabus. In the case of finals week, you must do this at least one week before the start of finals week. The instructor will provide the UMO with your exam and the UMO will administer it and provide the result to the instructor for grade reporting. Students who fail to follow this process and these deadlines risk not being able to have their accommodations for that exam.

Mental Health/Wellness Statement

- **If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try** [WellTrack](). Sign in and find information and tools at your fingertips, available to you at any time.

- **If you need support and information about options and resources**, please contact or see the [Office of the Dean of Students](). Call 765-494-1747. Hours of operation are M-F, 8 am- 5 pm.

- **If you find yourself struggling to find a healthy balance between academics, social life, stress**, etc., sign up for free one-on-one virtual or in-person sessions with a [Purdue Wellness Coach at RecWell](). Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is free and can be done on BoilerConnect.

- **If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students.** If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact [Counseling and Psychological Services (CAPS)]() at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office on the second floor of the Purdue University Student Health Center (PUSH) during business hours. The [CAPS website]() also offers resources specific to situations such as COVID-19.

Basic Needs Security

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday.

Commercial Note Taking in Classes

Notes taken in class are generally considered to be "derivative works" of the instructor's presentations and materials, and they are thus subject to the instructor's copyright in such presentations and materials. No individual is permitted to sell or otherwise barter notes, either to other students or to any commercial concern, for a course without the express written permission of the course instructor. See University Senate Document 03-9, April 19, 2004.

Course and Instructor Evaluations

During the last two weeks of the semester, you will be provided an opportunity to evaluate this course and your instructor(s) through online course evaluations. On Monday of the 14th week of classes, you will receive an official email from evaluation administrators with a link to the online site. You will have two weeks to complete this evaluation. Your participation in this evaluation is an integral part of this course. Your feedback is vital to improving education at Purdue University. We strongly urge you to participate in the evaluation system.

Emergency Preparation

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course Brightspace page. You are expected to read your @purdue.edu email on a frequent basis.