EE 385: Random Signals and Noise

Course Information

Contact

Instructor: Dr. W. David Pan
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Office Hours: Tuesday and Thursday, 11:00 am – noon, 4:00 pm – 5:00 pm.

Details

Course Name: Random Signals and Noise
Mode of Delivery: Traditional Course
Credit Hours: 3
Semester/Year: Fall/2024
Meeting day, time, and location: Tuesday and Thursday, 2:40 PM -- 4:00 PM, SST 207
Prerequisites: EE 382 or CPE 381

Overview

Random variables and probability description of signals. Introduction to random processes: autocorrelations, cross correlation, power spectral density. Noise analysis: thermal, shot, white, and colored. Response of electrical systems to random inputs.

Materials

Required

- Probabilistic Methods of Signal and System Analysis, Third Edition, by George R. Cooper and Clare D. McGillem, ISBN: 9780195123548.
- Matlab: http://chargerware.uah.edu/home/matlab

Course Outline (tentative)

- Introduction to Probability
- Random Variables
- Several Random Variables
- Elements of Statistics
- Random Processes
- Correlation Functions
- Spectral Density
- Response of Linear Systems to Random Inputs

Technology Statement

This course will use UAH's learning management system, Canvas, as well as other technology tools. Students will be expected to have access to a computer with internet capabilities in order to fully participate in this course.

Evaluation and Grading

The following grading scheme will apply in this course:

A = 90%–100%
B = 80%–89%
C = 70%–79%
D = 60%–69%
F = 0%–59%

Homework	Electronic submission to Canvas in PDF format	40%
Midterm Exam **October 15, 2024, (Tuesday)** **2:40 pm – 4:00 pm**	The Midterm Exam will be a comprehensive exam of all the material covered in about first half of the course. The test is closed-book and closed notes. However, you are allow to use one formula sheet (two sided), and a calculator.	30%
Final Exam **December 10, 2024, (Tuesday)** **3:00 pm – 5:30 pm**	The Final Exam will be a comprehensive final and will cover all of the topics and materials in this course. The test is closed-book and closed notes. However, you are allow to use two formula sheets (two sided), and a calculator.	30%

Homework Submission

Links to homework assignments will be posted on Canvas.

Homework must be electronically submitted to Canvas in PDF format. It is recommended that all homework should be typeset using a word processor. If your work is handwritten, you must scan in the pages into **bi-level** images (**with black texts on a white background**) and then convert the images to **a single PDF** file for submission to Canvas.

It is your responsibility to ensure the image quality shall be good enough (with texts being dark enough and clearly visible) in order for your work to receive an accurate grading. **Scanned images of unsatisfactory quality that hampers grading may result in points being deducted.**

Missed Assignments/Make-Ups/Extra Credit

The tests and final exam are very important for the course. **There will be NO late exams arranged.**

Timely submission of homework is also very important. **After homework solutions are posted, NO late homework will be accepted**.

If the solutions have not been discussed or posted, late homework submissions can be accepted with penalty within 24 hours after the due date/time.

The penalty is 10% for late submission with less than 24 hours past the due date/time.

Any work submitted after **24 hours past the due date/time**, or submitted **after the solutions** have been discussed or posted, **will NOT be accepted. The work will get a permanent zero.**

There will be NO extra credit being offered.

Attendance Policy

When you miss class, you miss important information. If you are absent, you are responsible for learning material covered in class. If you are absent when an assignment is due, you must have submitted the assignment prior to the due date to receive credit. Please contact your instructor if you have specific questions or concerns.

Communication & Instructional Continuity

In this class, the official mode of communication is through Canvas. Students can expect a response from the instructor within a 24 -- 48 hour timeframe.

In the event a regular scheduled course is unexpectedly interrupted, course requirements, due dates, and grading policy are subject to change when necessitated by revised course delivery, semester calendar, or other instances. Information about changes in this course can be obtained from the Canvas course webpage or by contacting the instructor. If you do not hear from the instructor after 48 hours, please contact the ECE department or the Dean of the College of Engineering.

If our regular scheduled class meeting is interrupted or the campus should unexpectedly close, students should immediately log onto Canvas and read any course announcements. Students are encouraged to continue the readings and other assignments as outlined on the course syllabus until otherwise advised. Any student who does not could fall behind in the course.

Course Conduct

All students must treat others with civility and respect and conduct themselves in a way that does not unreasonably interfere with the opportunity of other students to learn. All communication between student/instructor and between student/student should be respectful and professional.

AI Policy

The use of artificial intelligence models for assistance in completion of work for this course is strictly prohibited. Students who violate this policy will be subject to disciplinary action for academic misconduct.

Academic Honesty

Your written assignments and examinations must be your own work. Academic misconduct will not be tolerated. Examples of unacceptable behavior include plagiarism/use of prior work/use of Chegg and other online problem-solving sites/etc. To ensure that you are aware of what is considered academic misconduct, you should review carefully the definitions and examples provided in the Student Handbook. If you have questions in this regard, please contact the instructor without delay.

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All federal and state copyrights in the instructor's lectures and course materials are reserved by the instructor. You are authorized to take notes in class for your own personal use and for no other purpose. You are not authorized to record the instructor's lectures or to make any commercial use of them or to provide them to anyone else other than students currently enrolled in this course, without my prior written permission. In addition to legal sanctions for violations

of copyright law, students found in violation of these prohibitions may be subject to University disciplinary action under the Code of Student Conduct

Discussion of Concerns

If you have difficulties or concerns related to this course, your first action should be to discuss them with your instructor. If such a discussion would be uncomfortable for you or fails to resolve your difficulties, you should contact the ECE Department Chairperson, Dr. Alexandar Milenkovic at milenka@uah.edu. If you are still unsatisfied, you should contact Dr. Jennifer English, Associate Dean of the College of Engineering, at jennifer.english@uah.edu.

College/Department Information

COE Laptop requirement:

https://www.uah.edu/images/colleges/engineering/CUE2%20Files/Forms/coelaptoprequirements_2022.pdf.

Subject to Change

Every effort is made to follow the guidelines in the syllabus; however, if needed, the syllabus will be amended. You will be notified if changes are made.