ECE 421: Communication Theory

3 credits,   Tuesday & Thursday 11:00am ~ 12:15pm, Engr. B105

Instructor: J. Rockey Luo   **Office:**   B118, Engineering Building
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Office Hours: Tuesday & Thursday 1:00 ~ 2:30 pm, or by appointment.

Prerequisites: ECE303/STAT303, ECE312

Textbook: B. P. Lathi and Zhi Ding, "Modern Digital and Analog Communication Systems", 5th Edition, Oxford University Press, 2018.

Course Description: Analog communication (modulation), digital communication (source coding; modulation and detection; channel coding)

Grading and Exams: Midterm Exam   25%
                               Final Exam   35%
                               Homework Assignments   40%

Homework problems will be assigned on Tuesday every week, and will be due by the end of Tuesday of the next week, before 12am sharp. Late homework is accepted with 25% score reduction every day, unless written support from the university can be presented (this requirement is strict). Skipping the homework will result in a score equals 50% of the worst score among the submitted ones of that homework set.

Collaboration is allowed. However, you are required to present your results in a way reasonably different from others. Identical presentation (judged by the instructor) is treated as skipping the homework with an additional 50% score reduction. No collaboration is allowed in exams. All exams will be in class, **close book**, with two page (both sides) cheat sheet on a regular letter-size paper.

Attendance in class is **required**. If you are unable to attend class, you should provide an acceptable reason.

Schedule for Exams: Midterm: Thursday, October 19, 11:00am ~12:15pm.
                          Final: Tuesday, December 12, 9:40am ~11:40am

Course Outline and Tentative Schedule:

1.	Introduction	(1 lecture)
2.	Review of Signal and Systems	(3 lectures)
3.	Amplitude Modulation	(3 lectures)
4.	Angle Modulation	(2 lectures)
5.	Sampling, Quantization and Pulse Modulation	(4 lectures)
6.	Baseband Data Transmission	(3 lectures)
7.	Midterm Exam	(10/19)
8.	Digital Band-Pass Modulation Techniques	(2 lectures)
9.	Review of Probability and Random Process	(4 lectures)
10.	Noise in Analog Communications	(1 lecture)
11.	Noise in Digital Communications	(4 lectures)
12.	Error Probability Calculations	(1 lecture)
13.	Final Exam	(12/12)