Colorado State University, Ft. Collins **Fall 2025**

ECE 421: Telecommunication I

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

Instructor: J. Rockey Luo **Office:** B118, Engineering Building
Phone: (301) 502-2203 **E-mail:** rockey@colostate.edu
Office Hours: Tuesday & Thursday 1:00 ~ 2:30 pm, or by appointment.
Online Office Hour: Friday 9:30~11:00am, https://zoom.us/j/94543727534
Please let me know before coming to online office hour.

Prerequisites: ECE303/STAT303, ECE312

Textbook: B. P. Lathi and Zhi Ding, "Modern Digital and Analog Communication Systems", 5th Edition, Oxford University Press, 2018.
Or B. P. Lathi and Zhi Ding, "Modern Digital and Analog Communication Systems", 5th Edition, Oxford University Press, 2025.

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

Grading:

- Homeworks (20%)
- Midterm Exam (35%), Thursday, 11:00pm~12:15pm, 10/23
- Final Exam (45%), Tuesday, 6:20~8:20pm, 12/16

Homework:

- Assigned weekly on Tuesday; due the following Tuesday by 11:59 PM.
- Late submissions: 25% deduction per day late (strict unless university-approved documentation is provided).
- Skipped homework: counted as 50% of the lowest score among submitted assignments for that set.
- Collaboration is allowed, but final submissions must reflect your own understanding and differ in presentation. Identical solutions (as judged by the instructor) will be treated as skipped homework with an additional 50% penalty.

Exams:

- **In-class students:** Exams are closed book. Four pages (front and back) of notes on standard letter-size paper are allowed. Attendance is required; absences must be justified.
- **Online students:** Recorded lectures available via Canvas. Exams are closed book with the same note policy as above. Exams must be proctored via webcam on your own computer; appropriate equipment and environment are required.

Homework Submission

All assignments must be submitted through Canvas. Handwritten work may be scanned or photographed and compiled into a PDF for upload.

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	
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	