

**Michigan State University**  
**Department of Electrical & Computer Engineering**  
**ECE 865: Analog and Digital Communication**  
**Fall Semester, 2019**

**Instructor:** Dr. Tongtong Li  
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**Course Website:** <https://d21.msu.edu/d21/home>  
**Class Hours:** MW, 10:20 AM - 11:40 AM  
**Classroom:** 2320 EB  
**Office Hours:** MW, 3:00pm-4:00pm or by appointment

## Text

- John Barry, Edward Lee and David G. Messerschmitt, Digital Communication, 3rd edition, Kluwer Academic Publishers, 2004.

## Major References

- J.G. Proakis, Digital Communications, 4th Edition, McGraw-Hill Book Co., New York, 2002
- R.G. Gallager, Principles of Digital Communications, Cambridge University Press, New York, 2008
- S. Haykin, Adaptive Filter Theory, 4th Edition, Prentice Hall, 2001
- B. P. Lathi, Modern Digital and Analog Communication System, 4th Edition, Oxford University Press, 2009

## Course Outline

1. Analog vs. digital communications
2. Deterministic signals, random variables and random processes
3. A brief introduction to information theory: entropy and channel capacity
4. Modulation and demodulation techniques
5. Signal and receiver design over AWGN channels
6. Detection: ML and MAP detectors
7. Channel estimation and equalization for ISI channels
8. Error control coding and decoding (if time permits)

## Grading Policy

Homework	30%
Midterms (2)	40%
Final Project	30%

## Homework

Assignments and due dates will be announced in class. **Late homework and project will not be accepted.**

## Email policy

When sending emails to me regarding this course, make sure you always start the subject with “**ECE865**”.

## Attendance policy:

Attendance is required for this course since the lecture material will depart from the material in the book on a regular basis. At the same time, please be thoughtful of the professor and the other students, and do not walk in late if possible.