

# ECE 642 – Communication Systems I

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## Description

Principles of communication theory applied to the representation and transmission of information. Topics include analysis of deterministic and random signals, amplitude modulation, angle modulation, analysis of noise, basics of digital communication systems, matched filter and error probability.

## Prerequisites

Corequisite: ECE 673.

## Instructor

**Dr. Osvaldo Simeone**

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Office: 211 ECE Dept.

Office Hours: Wednesday 2-6pm or any other time by appointment

## Textbooks

M. Fitz, “Fundamentals of communication systems,” McGraw Hill, 2007, ISBN-10: 0071482806.

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## Requirements and Grading

- There will be **weekly assignments (20%)**, a **midterm (40%)** and a **final (40%)**. There are **no make-up exams** (conversion table for final grade: A (9-10), B+ (8-9), B (7-8), C+ (6-7), C (5.5-6), D (5-5.5), F (<5)).
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## Tentative schedule

Week	Topics	Chapters
1-2	- Introduction - Review of signals and systems (time and frequency domains)	Chapters 1, 2

<b>3</b>	- Complex baseband representation of bandpass signals	Chapter 4
<b>4-5</b>	- Analog communication basics - Analog amplitude modulation	Chapters 5, 6
<b>6</b>	- Analog angle modulation - Review of probability and random processes	Chapter 7 Chapters 3,9
<b>7</b>	MIDTERM	
<b>8-9</b>	- Review of probability and random processes - Noise in bandpass communication systems - Digital communication basics - Optimal single bit demodulation	Chapters 9,10, 12, 13
<b>10-11</b>	- Optimal single bit demodulation	Chapters 12, 13
<b>12-14</b>	- Transmitting more than one bit - Linear modulation	Chapters 14, 15, 16
	<b>FINAL</b>	

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### **NJIT Honor Code**

The NJIT Honor Code will be upheld, and any violation will be brought to the immediate attention of the Dean of Students.

Changes in the syllabus might be possible. Students will be informed of those changes in the class announcements and on the web.