

# Syllabus

- Instructors:**

**Instructor:** Prof. Mojtaba Vaezi  
**E-mail:** mvaezi at villanova dot edu  
**Phone:** (610) 519-5658  
**Office:** TOLENT 433A  
**Office Hours:** TW 10:00am-11:00am or by appointment

**Teaching Assistant:** Amro Lulu (alulu01@villanova.edu)

- Time and Location:**

	Time	Location
<b>Lectures</b>	MWF 11:30-12:20	TOLENT 301
<b>Labs</b>	M 14:30-16:30	TOLENT 427A

- Course Homepage:** <http://www.princeton.edu/~mvaezi/ece3770>.

Please visit the course website often for course information, special announcements, and course materials. All course materials (lecture notes, slides, assignments, supplementary documents, etc.) will be posted on the webpage.

- Assessment:**

	Weight	Remarks
<b>Homework</b>	20%	7–8 homework; each due in 1 week
<b>Labs</b>	25%	A total of 10 lab assignments
<b>Midterm 1</b>	15%	Monday, February 26, 2018 (in class)
<b>Midterm 2</b>	15%	Wednesday, April 4, 2018 (in class)
<b>Final Exam</b>	25%	According to the university schedule

- Homework policy:**

- Assigned on Mondays, due the following Monday at 5pm.
- There will be 25% penalty for late assignments. No assignment is accepted more than a week later.
- You are welcome to talk with other students about the homework, but everyone should turn in their own write up.

- There is a two week review period after graded work is returned; beyond that no grades will be changed.
- When submitting your assignments, please make sure that answers are in order and the solutions are neat and readable.

**Effective (recommended) study habits:** Attend the lectures, take notes, ask questions, study in groups, and do your homework individually.

- **Textbook and References:**

**Textbook:** Simon Haykin and Michael Moher, *Communication Systems*, (5th Edition) John Wiley & Sons, 2009

**References:**

1. B. P. Lathi and Zhi Ding, *Modern Digital and Analog Communication Systems*, 4th Edition, Oxford University Press. (ISBN 978-0-19-533145-5)
2. Proakis and Salehi, *Fundamentals of Communication Systems*, (2nd Edition) Pearson, 2013.

- **Outline:**

- **Section 1: Introduction and Mathematical Foundational** (Chapters 2 & 3)  
An overview of early and current communication systems/history. Review of frequency domain analysis of signals and systems. Review of signal classification and operations, signal distortion over communication channels, signal power, energy, spectral density.
- **Section 2: Analog Communications** (Chapters 4 & 5)  
An introduction to analog signal transmission and reception. Amplitude modulation schemes, including commercial AM radio, DSB, and SSB. Angle modulation schemes, such as commercial FM, PM, PSK, and FSK. Frequency division multiplexing.
- **Section 3: Digital Communications** (Chapters 6 & 7)  
Sampling theorem and the basis for digital communications. Quantization, PCM, line coding, and reducing ISI. Digital carrier modulation, including PAM, ASK, FSK, PSK, QPSK, and QAM SNR and system performance.

- **Student Code of Academic Integrity:** Academic integrity is a primary value for any institution of higher education. Cheating on tests, plagiarism, and other forms of academic dishonesty and misconduct are completely unacceptable, especially at Villanova which prides itself on its commitment to the Augustinian values of truth,

unity, and love. Students are expected to adhere to Villanova's Code of Academic Integrity accessible via the following link:

<https://www1.villanova.edu/villanova/provost/resources/student/policies/integrity>.

- **Statement on Disability:** “It is the policy of Villanova to make reasonable academic accommodations for qualified individuals with disabilities. If you are a person with a disability (non-physical) please register with the Learning Support office by contacting [Learning.support.services@villanova.edu](mailto:Learning.support.services@villanova.edu) or 610-519-5176 as soon as possible. Registration is needed in order to receive accommodations. The Office of Disability Services collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The ODS provides Villanova University students with physical disabilities the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact Gregory Hannah, advisor to students with disabilities @ 610-519-3209 or visit the office on the second floor of the Connelly Center.”