Instructor

Dr Yauhen Yakimenka

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, sampling, quantization, PCM, DM, DPCM, geometric representation of signals, error probability, matched filter and correlation receivers and performance analysis of communication systems signal-tonoise ratio.

Prerequisites

Corequisite is ECE 673.

Textbook

The required text for the term is *M. Fitz, Fundamentals of communication systems, McGraw Hill, 2007, ISBN-10:0071482806.* Free via NJIT's Access Engineering subscription.

Delivery

Weekly lectures, homework assignments

Assignments and grading

- **Homework**: There will be 11 sets of homework assignments which will be posted each on Canvas, 7 of those are graded. The homework is worth 20% of the final grade and is due until 6 p.m. on class day. Later assignments can be graded but scored with 0 points (**absolutely no exception**).
- **Exams**: There will be one midterm exam and one final exam. There will be no makeup exams except in the case of serious documented illness.
- Final score grade: homework 20%, quiz 10%, midterm 35%, final exam 35%.

Tentative schedule

- weeks 1-2: Introduction. Review of signals and systems (time and frequency domain) chapters 1,2 in the book
- week 3: Complex baseband representation of bandpass signals chapter 4
- weeks 4-5: Analog communication basics. Analog amplitude modulation chapters 5, 6
- week 6: Analog angle modulation. Review of probability, random variables, and random processes chapters 3, 7, 9
- week 7: midterm exam
- weeks 8-9: Review of probability, random variables, and random processes. Noise in bandpass communication systems. Digital communication basics. Optimal single bit demodulation chapters 9, 10, 12, 13
- weeks 10-11: Optimal single bit demodulation chapters 12, 13
- weeks 12-14: Transmitting more than one bit. Linear modulation chapters 14, 15, 16

• final exams week: final exam