EEEN 322
Communication Engineering, Spring 2019
(5 ECTS)

Instructor Information:

Instructor: İpek Şen **Office:** E3-208
E-mail: ipek.sen@bilgi.edu.tr **Office Hours:** Thursday 10:00-12:00
TA: Sami Utku Çelikok

Course description:

This course;

- Introduces basic tools and methods of communication engineering
- Focuses primarily on analog communications
- Reviews some basic concepts in Fourier analysis and random processes explains their significance within the context of communications systems
- Explains amplitude and phase/frequency modulation techniques
- Emphasizes system design goals and the need for trade-offs among basic system parameters such as signal-to-noise ratio (SNR), probability of error and bandwidth expenditure

Course objectives:

In this course, the basic concepts behind the design and analysis of communications engineering systems are introduced. The theory of digital communications and practice of today's communications systems are discussed.

Course Learning Outcomes:

Following the successful completion of this course work, students will be able to,

1. Analyze basic digital communication systems involving random signals, coding, and modulation.
2. Apply concepts and techniques from Fourier analysis and circuit analysis to communication systems.
3. Use probability theory and stochastic processes in communication system applications.

Prerequisites (as special condition): EEEN 201 and EEEN 321

Text Books: B. P. Lathi, Zhi Ding, Modern Digital and Analog Communication Systems, Oxford University Press

Requirements

1. Students must attend at least 70 % of the lectures, and problem sessions.
2. Students who miss a lecture or a problem session are completely responsible for obtaining the material they missed.
3. No make-up exams (for the midterm) will be given.
4. Late assignments will lose 20% of their total grades per day. Assignments returned after the third day following the deadline will not be accepted.
5. Adherence to the University Academic Integrity policy is expected.

Exams and Grading:

Evaluation Type	Percentage
Homeworks	10
Quizzes	15
Midterm Exam	30
Final Exam	45
TOTAL	**100**

Weekly Schedule *(Subject to minor changes)*

Date	Topic
Week 1	Introduction to communication systems.
Week 2	Signals, classification of signals, signal space.
Week 3	Signal representation by orthogonal signal sets. The Fourier series.
Week 4	The Fourier transform.
Week 5	Double sideband modulation and amplitude modulation.
Week 6	Single sideband modulation and vestigial modulation.
Week 7	Carrier acquisition and superheterodyne receiver.
Week 8	Frequency modulation and phase modulation.
Week 9	Key concepts in the theory of probability and random processes.
Week 10	Key concepts in the theory of probability and random processes. Random processes in communications.
Week 11	Transmission of random processes through linear systems. Bandpass random processes.
Week 12	Performance analysis of amplitude modulated systems in the presence of noise.
Week 13	Performance analysis of angle modulated systems in the presence of noise.
Week 14	General review.