

Bilkent University
Department of Electrical and Electronics Engineering

EEE 431 TELECOMMUNICATIONS I

Spring 2012 Semester
General Information & Course Syllabus

Instructor:

Dr. Defne Aktaş
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Office Hour: Fri. 9:40-10:30, or email for an appointment

Assistants: Ayça Özçelikkale Hünerli (coordinator), EE-207, tel: 1173, ayca@ee.bilkent.edu.tr
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Lectures: Wed. 8:40-10:30, Fri. 10:40-12:30, EE-05

Course website: <http://www.ee.bilkent.edu.tr/~ee431/>

Course Description: This is the first course in the series of two senior level courses on telecommunications aiming to introduce the basic principles behind the analysis and design of modern communication systems. The main goal of this course is to introduce the concepts of modulation and demodulation of information and the effect of noise on system performance. The topics that will be covered are spectral analysis of signals and systems, baseband representation of carrier modulated signals, random processes, continuous wave modulation (AM and FM) and their noise analysis, pulse modulation.

Prerequisites by topic:

1. Probability theory (MATH 255)
2. Linear system theory and signal representations (EEE 321)
3. Knowledge of a computing tool (Matlab)

Textbook: Simon Haykin and Michael Moher, *Communication Systems*, 5th ed., John Wiley & Sons, 2010.

References:

- John G. Proakis and Masoud Salehi, *Communication Systems Engineering*, 2nd edition, Prentice Hall, 2002.
- Leon W. Couch, *Digital and Analog Communication Systems*, 7th ed., Prentice Hall, 2007.
- B. P. Lathi, *Modern Digital and Analog Communication Systems*, 3rd ed., Oxford University Press, 1998.
- A. Bruce Carlson, Paul B. Crilly, and Janet C. Rutledge, *Communication Systems: An Introduction to Signals and Noise in Electrical Communication*, 4th ed., McGraw-Hill, 2001.

Course Outline:

1. Introduction to communication systems (Chapter 1)
2. Fourier analysis of signals and systems (Chapter 2)
3. Analog modulation
 - a. Amplitude modulation (Chapter 3)
 - b. Angle modulation (Chapter 4)
4. Random processes (Chapter 5)
5. Noise in analog communication systems (Chapter 6)
6. Digital representation of analog signals (Chapter 7)

Grading:

Matlab Assignments:	5%
Homeworks:	10%
Midterm Exam I:	25%
Midterm Exam II:	25%
Final Exam:	35%

Exam Schedule:

Midterm Exam I:	Monday, March 19 th , 2012 at 17:40-19:40 in EE 04,05.
Midterm Exam II:	Saturday, April 28 th , 2012 at 09:30-11:30 in EE 04,05.
Final Exam:	To be determined by the Faculty of Engineering

General Policies:

1. **Attendance policy:** The attendance will be taken at each lecture. If you fail to attend to 30% or more of the lectures, you will get an FX grade. If you attend to less than 70% of the lectures, your final letter grade will be lowered by one letter grade.
2. **Late policy:** No late assignment will be accepted unless prior arrangements have been made with the instructors. Arrangements must be made at least 24 hours in advance. Emergency situations will be handled on a case by case basis.

3. **Honor code:** All written material handed in to the instructors (e.g. homeworks, exams, etc.) must be **student's own**. Copying from others will not be tolerated. Failure to comply with the honor code will be considered as a violation of university's Academic Honesty Policy and necessary action will be taken. In the event of copying, both parties will be held equally responsible.
4. **Homeworks and Matlab Assignments:** There will be approximately 6 homework assignments. Most homeworks will include Matlab coding assignment(s). Problems including Matlab implementations will be graded separately and contribute to Matlab Assignments portion of the overall course grade.

It is student's responsibility to make sure that homework is dropped in the submission box before the deadline. The solutions of the homeworks will be posted on the course website. Discussion on homework problems is encouraged, however, each student is required to work out each and every problem him/herself.
5. **Exams:** There will be two midterm exams and one final exam. All exams are closed book and closed notes. The necessary identities and transforms will be provided in the exam booklet.
6. **FX grade policy:** If you attend to less than 30% of the lectures or did not take the final exam or one of the midterm exams (or the make-up exams if it applies), you will get an FX grade.
7. **Make-up exam policy:** Only one make-up exam will be administered during the semester, covering all the topics. The single make-up exam will be given couple of days after the final exam for those students who have missed an exam with a valid and well-documented excuse that is recognized by the university. If the student misses an exam, it is the student's responsibility to contact the instructor and present her the necessary medical documents as soon as possible.
8. **Course website:** We will be using Moodle portal for posting announcements, assigning homeworks and posting homework solutions. You should be able to access Moodle portal for EEE431 from your SRS account automatically if you are enrolled in the course.

Feedback: If there is an issue in this class information that concerns you or if you believe some important issue is not addressed, please let us know.