

# STANFORD UNIVERSITY

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## Course Information

### EE 179 - Introduction to Communications - Spring 2009

**Instructor:** Andrea Goldsmith, 371 Packard, ext. 5-6932, email: andrea@ee, OHs: MW 10-11 am and by appt.

**Class Time and Location:** MW 11 am-12:15 pm, McCullough 126.

**Class Homepage:** <http://www.stanford.edu/class/ee179>. The homepage will have all class handouts, homework assignments, corrections to handouts and homeworks, supplemental reading, etc.

**Class Mailing List:** You will be automatically subscribed to the class mailing list ee179-students when you register for the class in Axxess. You cannot join this mailing list unless you are registered. To join the guest mailing list ee179-guest please send an email to the TA. Sending mail to ee179-staff@stanford.edu will reach the instructor and TA.

**Class TA:** Hao Zou, haozou@stanford, OHs: Tuesday 7-8pm and Thursday 9-9:50am @Packard 107. Email OHs: W 9-10 pm.

**Grader:** Seyed Reza Mir Ghaderi (Reza), rezam@stanford.edu.

**Class Discussion Section:** Tuesday Afternoon 6-7pm Building 60 RM 118.

**Class Administrator:** Pat Oshiro, poshiro@stanford, 365 Packard, phone: 650-723-2681. Fax: 650-724-3652. Office Hours (paper pickup/dropff): Th: 4-5.

**Required Text:** *An Introduction to Analog and Digital Communications, 2nd Ed.* by Simon Haykin and Michael Moher.

**Supplemental Texts:** The following references are on 2-hour reserve in Terman.

- *Signals and Systems*, A.V. Oppenheim and A.S. Willsky, Prentice Hall: 1997.
- *Modern Digital and Analog Communication Systems*, B.P. Lathi, Oxford University Press: 1989.
- *Modern Communication Systems Principles and Applications*, L.W. Couch II, Prentice Hall: 1995.
- *Principles of Analog and Digital Communications*, J.D. Gibson, Prentice Hall: 1993.
- *Principles of Communications: Systems, Modulation, and Noise*, R.E. Ziemer and W.H. Tranter, Wiley: 1995.

The first book is an excellent introduction to Fourier analysis. The next three books cover similar material as the required text, and should be used to get alternate explanations and additional examples. The last book is more advanced than the material covered in this course, and should be used if you would like a more in-depth coverage of the course material.

**Prerequisites:** EE 102a or consent of instructor.

**Grading Policy:** Problem Sets - 30%, Midterm - 30%, Final - 40%.

**Exam Policy:** The midterm and final must be taken at their scheduled times. The midterm is scheduled for 5/6, 11 am-12:30 pm (although this may change depending on the pace of the course), and the final is scheduled for 6/9, 8:30-11:30 am. Exceptions to this policy are only made in very rare circumstances, typically due to unforeseen circumstances such as a medical or family emergency. If you have an exam conflict it must be discussed with the professor during the first week of class, especially exam conflicts arising from taking two classes that overlap in time.

**Homework Policy:** Homeworks will be assigned on Wednesday, and will be due by 4 pm sharp in Pat's office the following Thursday. Homeworks will lose 25% credit per day late. Your lowest homework grade will be dropped. Up to three students can collaborate on each homework and turn in one writeup. Collaboration requires that all involved students work out *each and every* problem. This can be done by working out the problems together, or each student can work out the problems individually and then compare and discuss their work to arrive at a final solution. **It is not permitted on any homework** for collaborators to divide up the problems, or for one person to work out a problem or problems and the others "check the work".

### Tentative Course Syllabus

<u>Lecture</u>	<u>Date</u>	<u>Topic</u>	<u>Reading</u>
1	4/1	Introduction. Communication Systems Today.	
2	4/6	Key Concepts in Communication Systems 4/6 Lecture will be rescheduled to 4/3 or 4/10.	Chp. 1
3-4	4/8-4/13	Fourier Review and Communication Examples	Chp. 2.1-2.7, App 2
5	4/15	Energy/Power Spectral Density (PSD) and Autocorrelation	Chp. 2.8-2.9.
6	4/20	Probability Theory.	Chp. 8.1 -8.3
7-8	4/22-4/27	Random Signals and their PSD.	Chp. 8.6 - 8.8
9	4/29	Gaussian Noise. Midterm Review.	Chp. 8.9 - 8.12
10	5/4	Introduction to Amplitude Modulation	Chp. 3.1-3.2
11	5/6	<b>Midterm Exam. 11am-12:30pm.</b>	
12	5/11	Generation and Detection of AM. 5/11 Lecture will be rescheduled to 5/15.	Chp. 3.3-3.4
13	5/13	Carrier and Sideband Suppression, AM Radio, FM.	Chp. 3.9, 4.1-4.2, 9.1-9.6
14-15	5/18-5/20 5/25	Frequency Modulation and Applications <i>Memorial Day Holiday.</i>	Chp. 4.4 - 4.8,
16-17	5/27-6/1	Digital Modulation and Optimal Receivers.	Chp. 7.1-7.5, 10.1-4,10.6
18	6/3	Performance of Digital Receivers in Noise. Course Summary.	

- There will be no lecture on 4/6, 5/11 As a makeup, we will be rescheduling lecture on April 6 to April 10 and the lecture on May 11 to May 15.
- **Final exam is scheduled for Tuesday, June 9, from 8:30-11:30am.**