EE 359 - Wireless Communications - Fall 2005

Course Information

Instructor: Andrea Goldsmith, 371 Packard, ext. 5-6932, email: andrea@ee. OHs are MW 12:30-1:30 pm, and by appointment.

Class Time and Location: MW, 11-12:15 p.m., Thornton 102.

Class Homepage: http://www.stanford.edu/class/ee359. The homepage has all class policies, handouts, homework assignments, required and recommended reading, corrections to handouts and homeworks, and any important announcements.

Class Mailing List: Registered students are automatically subscribed to the class mailing list ee359-aut0506-students. You cannot join this mailing list unless you are an on-campus registered student. SCPD students and auditors can join the guest mailing list ee359-guest by emailing the TA. Announcements will be sent to both mailing lists. Sending mail to ee359-staff@stanford.edu will reach the instructor and TA.

Class GTA: Ritesh Madan, email: rajivag@stanford. Discussion Section: T 5-6 pm, Room TBD, OHs: T after discussion, W 4:30-6:30 pm, Email OHs: Th 10-11 am.

Class Administrator: Joice DeBolt, joice@stanford, 365 Packard, phone: 3-3164. Homework pickup and dropoff: Thursday at noon.

Required and Recommended Texts: The required text is *Wireless Communications* from Cambridge University press. It is available at the Stanford bookstore and Amazon.com. Extra credit points will be awarded for any typos or mistakes that you find in the book. A Stanford bookstore gift certificate will be awarded to the student that gets the most extra credit points.

Prerequisites: EE 279 or equivalent (i.e. an undergraduate course covering digital communications). This class may not be taken without this prerequisite. If you are not sure if classes from other universities satisfy the prerequisites, speak with the professor.

Grading Policy: There are two options for grading, the project option and the nonproject option. In the nonproject option the course grade is based on HWs and exams while in the project option the course grade is based on HWs, exams, and a term project. Students selecting the project option will receive 4 units for the class, whereas students selecting the nonproject option will receive 3 units. You can also elect the project option and sign up for just 3 units if you have unit constraints. You can switch between options as long as the registrar deadline for adding/dropping units is met, and to do a project you must turn in a project proposal by the proposal deadline. The specific grading policy for each option is as follows:
Project Option (4 units): Problem Sets - 20%, Exam 1 - 25%, Exam 2 - 30%, Project - 25%.
Nonproject Option (3 units): Problem Sets - 25%, Exam 1 - 35%, Exam 2 - 40%

Homeworks: Homeworks are posted to the class website on Wednesday, and are due the following Thursday at noon. Late homeworks lose 1/4 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 all collaborators to 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 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".

Project: The project can be a literature survey, analysis, and/or simulation on any topic in wireless. You must set up a website for your project that will be linked to the course homepage. A project proposal must be posted to your project website (with the web address emailed to the TA) by 11/18 at 5 pm, and the final project report must be posted to your project website by 12/9 at 5 pm. Late project proposals and reports will be penalized. More information about the project requirements, and possible collaboration on the project, is in a separate handout.

Exams: The exams must be taken at their scheduled times. Exam 1 is scheduled for 11/7 (11-1 pm) and Exam 2 is scheduled for 12/14 (9:30-11:30), our scheduled final exam time. Exam 1 may be moved depending on how close we follow the syllabus. Exceptions to this policy for anything other than a documented medical or family emergency will be very rare. Any conflicts with the exam dates must be brought to the attention of the instructor as soon as they arise. In particular, you should not take this class if you know you have an exam conflict, unless you make arrangements with the professor at the beginning of the quarter.

SCPD students: HW deadlines are the same as the regular class: HWs must be faxed directly to Joice at 650 724 3652 by the deadline for the rest of the class (do not go through SCPD). Exceptions to this HW deadline policy require instructor consent. Exams MUST be taken at the same time as the regular class. Exceptions will be made in unusual circumstances and must be cleared with the instructor well in advance (1-2 weeks). It is expected that students at local Silicon Valley companies will come to Stanford to take exams. For students that are not local, you MUST contact the professor one week before an exam to make arrangements for remote testing.

Required and Supplemental Reading: Required reading from the course textbook will be posted on the class website prior to each lecture. The reading will generally be from the class reader. For each lecture, supplemental reading from the recommended/reserve textbooks, journal papers, and/or magazine articles will also be posted to the class website. The following reference texts are on 1 day reserve at the Terman library:

- *Wireless Communications - Principles and Practice* by T. S. Rappaport. 2nd Ed. Prentice Hall, 2001.
- *Principles of Mobile Communications* by G. L. Stüber. 2nd Ed. Kluwer Academic Publishers, 2001.
- *Fundamentals of Wireless Communication* by D. Tse and P. Viswanath, Cambridge University Press, 2005.
- *Microwave Mobile Communications,* W. C. Jakes, Wiley: 1974. Also IEEE Press: 1993.
- *The Mobile Radio Propagation Channel,* J.D. Parsons, Wiley: 1992.
- *Digital Communication Techniques: Signal Design and Detection,* M. K. Simon, S. M. Hinedi, and W. C. Lindsey, Prentice Hall: 1995.
- *Digital Communications,* J.G. Proakis, 4th Ed., McGraw-Hill: 2001.
- *Digital Communications over Fading Channels, A Unified Approach to Performance Analysis* M. K. Simon and M.-S. Alouini, Wiley: 2000.
- *Course Notes: EE379A*. J.M. Cioffi, Stanford University.
- *Multi-Carrier Digital Communications, Theory and Applications of OFDM* A.R.S. Bahai and B.R. Saltzberg, Kluwer: 1999.
- *CDMA: Principles of Spread Spectrum Communication,* A.J. Viterbi, Addison-Wesley 1995.
- *Spread Spectrum Communications Handbook,* M.K. Simon, J.K. Omura, R.A. Scholtz, and B.K. Levitt, McGraw-Hill 1994.
- *Multiuser Detection,* S. Verdu, Cambridge: 1999.