
EE 359 - Wireless Communications - Winter 2020

Course Information

Instructor: Professor Andrea Goldsmith, 371 Packard, 725-6932, email: andrea@ee.stanford.edu. OHs: TTh after class and by appointment.

Class Time and Location: Tue, Thur 1:30-2:50 PM, Location: [Thornton 102](#).

Discussion Section: Wednesday 4-5pm (tentative). Room TBA.

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, including calendar changes (recommended that you check this often or add to your personal calendar). A tentative syllabus is also posted.

Class Mailing List: Registered students are automatically subscribed to the class mailing list ee359-win1920-students. You cannot join this mailing list unless you are a registered student. Auditors can join the guest mailing list ee359-win1920-guests by emailing the TA. Announcements will be sent to both mailing lists. Sending mail to <mailto:ee359-win1920-staff@lists.stanford.edu> will reach the instructor and TA.

Class TA: Tom Dean, email: trdean@stanford.edu. OHs (tentative): Wed 5-6pm, Fri 11-12pm. Emails sent directly or via Piazza during OHs will be answered during or just after the OH.

Class Administrator: Dash Corbett, email: dashiellcorbett@stanford.edu, 365 Packard, 723-2681.

Piazza: A Piazza website has been created for the class (<https://piazza.com/stanford/win2020/ee359/home>). We **strongly encourage questions discussions related to class material take place on Piazza**. You can set your desired post visibility, and TA will respond to Piazza before responding to questions sent via email. All students have been enrolled in the site – you will receive an email from Piazza on how to complete your registration. We will use a Piazza poll to determine conflicts with the proposed OH/discussion times.

Homework pickup and dropoff: Fridays by 4pm.

Required Text: The required text is a draft of the 2nd edition of Wireless Communications by Andrea Goldsmith (1st edition published by Cambridge University Press in 2005). The first 6 chapters are currently available as a [course reader](#) on the class website and at the Stanford bookstore. A reader with the chapters covered in the 2nd half of the class will be available midway through the quarter. A hardcopy of the reader is needed for exams as computers are not allowed in exams. Typos, errors, and suggestions for the reader can be uploaded [here](#). All entries to this list will be entered into a raffle for a \$100 Amazon gift card (3 cards will be awarded).

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 – Two Options: The course grade is based on HWs, exams and the optional project:

Project Option (4 units): Problem Sets - 20%, Midterm - 25%, Final - 30%, Project - 25%

Non-project Option (3 units): Problem Sets - 25%, Midterm - 35%, Final - 40%

Students who would like to take the class for 3 units due to tuition considerations or a restriction on the number of units they can enroll for, and are interested in doing a project, can do so with prior approval from the instructor. Details on the project can be found in the **Project Handout** on the class website. Project proposals are due at midnight 2/7 (posted to a created website) and projects are due at midnight 3/14 (posted to website). These are hard deadlines with extensions only granted for documented medical or other emergencies.

Homeworks: Homeworks are posted to the class website on Thursday, and are due the following Friday at 4pm (hardcopy to Dash or uploaded to Canvas). Homeworks turned in after the Friday deadline receive 2/3 credit if turned in by 8am Sunday (on Canvas), and 1/3 credit if turned in by 8am Monday (hard copy of Canvas). Your lowest homework grade will be dropped. Up to three students can collaborate on each homework and turn in one write-up. 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", or to use homework solutions from previous years or found online. Such unpermitted aid is an **honor code violation** and will be dealt with according to Stanford's policy on honor code violations. HW grades will be posted to Canvas.

Extra Credit: Up to 2 total "design your own" HW questions can be created and solved for extra credit, 1 on material before the MT (turned in before the MT) and 1 on material after the MT (turned in before the final). Each "design your own" HW question is worth up to 25 extra credit points. Points will be awarded based on creativity, clarity, level of difficulty, and correctness of the solution. In addition, 20 extra credit points are awarded for filling out the class evaluations before the end of the quarter. Extra credit points are not used in computing the class grading curve; once the curve is computed, weighted extra credit points are added to a student's total points.

Exams: The exams must be taken at their scheduled times. The midterm will take place the week of **2/17**. It will be scheduled outside class time since the duration is 2 hours. The actual date and time will be decided at least several weeks in advance. The Final is scheduled for **3/17** from 3:30-6:30pm (pizza afterwards). Exceptions to taking the exams at their schedule times 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.

Required and Supplemental Reading: Required reading from the course reader and any supplemental reading is in the class syllabus. 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 available at the Engineering library:

- *Wireless communications* by Andreas Molisch, Wiley-IEEE Press, 2nd Ed, 2011.
- *Wireless Communications - Principles and Practice* by T. S. Rappaport. 2nd Ed. Prentice Hall, 2002.
- *Principles of Mobile Communications* by G. L. Stuber. 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.
- *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, 5th Ed., McGraw-Hill: 2008.
- *Digital Communications over Fading Channels*, M. K. Simon and M.-S. Alouini, 2nd Ed, Wiley: 2005.
- *Course Notes: EE379A*. J.M. Cioffi, Stanford University. Available at <http://www.stanford.edu/group/cioffi/>
- *Multi-Carrier Digital Communications, Theory and Applications of OFDM*, A.R.S. Bahai and B.R. Saltzberg, Kluwer: 1999.