



TLEN 5320-3 Telecom Lab - Wireless, Fall 2000

Timothy X Brown

M 1:00-1:50 ECCR 116 + Labs in Telecom Lab ECCR 275A

The Course:

This course will serve as hands on look at wireless communications.

The course is designed to complement TLEN 5510 by taking several subjects to greater depth. Students will work with and in some cases build radio frequency (RF) test equipment, transmitters, receivers, antennas, and wireless communication systems.

Prerequisites: TLEN 5510 (may also be taken concurrently).

Web Page:

<http://itp.colorado.edu/~tlen5320/>

Grading:

Exams (60%): Two equally weighted exams. Each will consist of a written and lab component. Exam 1 written on Oct. 16 + lab later in week.

Exam 2 written Dec. 11 + lab later in week.

Lab (30%): 14 labs graded on the basis of a team writeup.

Quizzes (10%): Each class will start with a short quiz based on the prelab reading and exercises. The lowest quiz will be dropped.

The Text:

Wireless Communications: Principles and Practice, by Rappaport, Prentice-Hall 1996.
ISBN 0-13-375536-3.

Note: *This is the same as for TLEN 5510.*

Supplemental Texts (on reserve in the engineering library):

For complementary look at wireless protocols:

Wireless Personal Communications Systems, By Goodman, Addison-Wesley, 1997.
ISBN 0-201-63470-8

For the basic text on antenna design:

Antenna Theory: analysis and design, 2nd ed., Balanis, Wiley, 1997, ISBN 0-471592684

For detailed coverage of analog and digital cellular standards:

Cellular Radio: Analog and Digital Systems, By Asha Mehrotra, Artech House, 1994.
ISBN 0-89006-731-7.



For all the details you ever want:

Mobile Cellular Telecommunications: Analog and Digital Systems, 2nd Ed. By C.Y. Lee, McGraw Hill, 1995. ISBN 0-07-038089-9

For a detailed look at IS-95:

IS-95 CDMA And Cdma2000 : Cellular/PCS Systems Implementation, By Garg, Prentice Hall, 1999. ISBN 0-13-087112-5

Outline:

Lab times will be scheduled by students and TA during the week. Labs are designed to be completed in approximately 3 hours. Labs are performed in teams of four. The lab writeups contain a detailed introduction to the lab subject and students are expected to read and do the prelab before the lecture on Monday. This course continues to evolve as we get new equipment. Some of the later labs may change.

Week	Lab
1	Introduction to RF measurement equipment.
2	Antenna Design.
3	Analog modulation.
4	Exploring the Radio Spectrum
5	Outdoor radio propagation.
6	Indoor radio propagation (no class Thu/Fri complete labs by Wed).
7	The Cellular Concept.
8	<i>Exam 1. Written, inclass on Monday. Lab exam later in week.</i>
9	AM/FM modulator and demodulator.
10	Digital modulation.
11	Pseudo Noise Sequence Generator.
12	Direct Sequence Spread Spectrum.
13	IEEE 802.11 Wireless LAN (no class Thu/Fri complete labs by Wed).
14	IS-95 CDMA layer 1 & 2.
15	IS-95 CDMA layer 3 messaging.
16	<i>Exam 2. Written, inclass on Monday. Lab exam later in week.</i>