

SYLLABUS

EE 484: Communication System Design

Spring 2012

Course Description:

The course has been re-designed to help students link and understand both system level design and RF circuit design. This is a highly important skill for students seeking careers in the wireless industry. This project-based course has two main components that each design team will undertake:

1. WiMAX System Design – Design of a WiMAX network to cover a metropolitan area that includes layout of cell, link budget analysis, etc.
2. RF Circuit Design – Using discrete components and available circuit models, the team will propose, design, and simulate an RF transceiver for the WiMAX system. Circuit simulation tools will be utilized for the simulation process.

Because 3GPP Long Term Evolution (LTE) is very similar to WiMAX, the skills learned in the project will apply to the rapidly developing LTE marketplace.

At the conclusion of this course, each design team will have developed a WiMAX capable RF product for their proposed WiMAX network.

This class is ideal for both students who plan to pursue system or circuit related careers.

Instructor: Prof. Michael A. Enright
PHE414, (213) 740-6433
Email: enright@usc.edu
Office Hours: MW 4:00–5:00p

Teaching Assistant: TBD

Website: No Blackboard until 8 students are registered

Required Text: *WiMAX RF Systems Engineering*, Zerhun Abate, Artech House Press, 2009.

Reference Text: *Digital Communications: Fundamentals and Applications, 2nd Edition*, Bernard Sklar, Prentice-Hall, 2001.

Schedule: Lectures: 5:00–6:20 MW KAP 141
Midterm: Wednesday, February 29th, in class

Course Topics:

Week 1: Fundamentals of Communication
Week 2-3: WiMAX Network Design
Week 4-5: Analog Circuit Design
Week 6: Modeling and Simulation
Weeks 7-15: Project Discussion (class meets infrequently)

Grading: Homework/ Attendance 25%
Midterm 25%
Final Project 50%

POLICIES

1. Attendance is required for the course and will be graded.
2. Homework:
 - a. The final homework grade will be your average score. Homework problems may involve the use of MATLAB.
 - b. Homework must be turned in at specified time and location. Late homework will not be accepted!
 - c. You are encouraged to discuss homework problems with your friends or in small groups, but do the homework individually.
3. Academic Integrity:
 - a. If your homework solutions are taken from a manual, from my prepared solutions, or are clearly the same as another students (either in the text of your solution or MATLAB code), you will receive a zero for your overall homework grade.
 - b. Cheating on exams is unacceptable and will result in an F for the course, and possible further disciplinary action.
4. Exams:
 - a. Exam will be cumulative, closed book, closed notes, one 8.5x11 sheet.
 - b. No makeup midterm will be given unless a verifiable emergency has taken place. A doctor's note with contact information will be required to retake an exam.
5. When final grades are posted, they are final! Personal circumstances will not be considered. I've heard it all before.
6. Grading percentages above are expected, but not final. They can change at any time.

SUGGESTIONS

The primary interest here is that you learn as much as possible about signals and systems. There are many new and exciting technologies that are based upon the topics that we will discuss in this class. It is our hope that you build upon these fundamentals and find an exciting target for your own future studies.

Additionally, there are a few important things you can do: (i) ask questions not only about the lecture material as it is taught, but also as to how it relates to engineering careers, (ii) make use of office hours, (iii) actively respond to questions posed in class, (iv) don't sit in the back of the classroom, (v) occasionally visit the library or Google to read about an application, (vi) learn to use MATLAB, (vii) if you are struggling with the material, come and ask me about it as soon as possible, not just before the exam, (viii) remember that exams and grades are a means to an end and not an end in itself.

STUDENTS WITH DISABILITIES:

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. – 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.