

EE 564: Communication Theory

Spring 2014

Lecture: Monday 5:00-7:40 p.m. in KAP 148

Instructor: Christopher Wayne Walker, Ph.D.

Office: PHE 414

Office Hours: Monday 4:00-4:50 p.m. and 7:45-8:55 p.m.

Daytime phone: (213) 740-7654 – USC during office hours
or (310) 812-5176 (voicemail available)

email: cwwalker@cwwphd.com

Course web page: <http://www.cwwphd.com> and/or Blackboard

Text: See references below for textbook information.

Co-req: Random Processes (EE 562a). All pre-reqs of EE 562a are pre-reqs for EE 564.

First Lecture: Monday, Jan. 13

Last Lecture: Monday, April 28

No class: Monday, Jan. 20 (MLK) and March 17 (Spring Break)

Course Grading Policy:

Method	Date	Weight
Homework	As assigned in class	10%
Midterm	Monday, March 10, 5:00 – 6:15 p.m.	40%
Final	Monday, May 12, 4:30 – 6:30 p.m.	50%

Notes: The exams are closed book. One 8 ½ x 11 sheet of notes (front and back) is allowed on the midterm. Two such sheets are allowed on the final. Calculators are allowed on all exams. No computers or cell phones are allowed for exams.

Contact Information: You are welcome to consult with me during office hours. If my office hours are not convenient for you or else you have a question that needs addressing before you can see me, you are welcome to call or email me. Email is the preferred method of contact if I can answer your question with a text email response, but if we need to have more interaction then you are welcome to call me at my office. If you call and I cannot speak with you immediately then I will set up a time to call you back to discuss any issues or concerns you may have. I want this course to be a positive learning experience for you so please make sure you get all your questions answered.

Homework: Homework will be assigned regularly. You may work with others on the homework assignments but the work you hand in must be your own and not copied from another student.

Late Homework Policy: No late homework will be accepted. A late assignment results in a zero grade.

Make-up Exams: No make-up exams will be given. If you cannot make the exam dates due to a conflict, you must notify me by Monday, Feb. 4 (the last day to add/drop the course). If I cannot accommodate your schedule, you must drop the class. In the case of a required business trip or a medical emergency, a signed letter from your manager or doctor is required. This letter must include the telephone number of your supervisor or doctor.

Grade Adjustment: If you dispute any scoring of a problem on an exam or homework set, you have one week from the date that the graded paper is returned to request a change in the grade. After this time, no further alterations will be considered. All requests for a change in grade must be submitted to me in writing.

Academic Integrity Policy: As per university guidelines published in SCampus, the academic integrity policy will be upheld.

References:

- [1] J. Proakis, *Fundamentals of Communication Systems*, 2nd ed., Prentice-Hall, 2013.
- [2] J. Proakis, *Digital Communications*, 5th edition, McGraw Hill, 2007.
- [3] M. K. Simon, S. M. Hinedi, and W. C. Lindsey, *Digital Communication Techniques: Signal Detection and Design*, Prentice Hall, 1994.
- [4] B. Sklar, *Digital Communications*, 2nd ed., Prentice Hall, 2001.
- [5] H. Meyr and G. Ascheid, *Synchronization in Digital Communications*, John Wiley & Sons, 1990.
- [6] R. N. McDonough and A. D. Whalen, *Detection of Signals in Noise*, 2nd ed., Elsevier Science, 1995.
- [7] D. Martin and C. W. Walker, *Detection and Measurement of Pulsed Waveforms*, book in progress.

** You should purchase one of the first two references above for this course. **

Topics:

Overview of Digital Communication Theory and Systems
Modulation Techniques (including BEM)
Demodulation Techniques
Performance Analysis
Detection of Signals in Noise
MAP and MLE Estimation
Hypothesis Testing
Channel Equalization
Clock and Carrier Synchronization
Simulating BER Performance

The above list of topics is tentative and is subject to change as the course progresses.