EE 451 — Digital Communications  
Spring 2009

Instructor: T. R. Fischer; Office 404 EE/ME Building.

Office hours: Tuesday 3:00-4:30 pm, Wed., 1:30-3:00 pm, or by arrangement.


Prerequisites: EE 341; Stat 360 or 443 or equivalent, or permission of the instructor.

Course Requirements:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework*</td>
<td>10%</td>
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<tr>
<td>Computer Exercises*</td>
<td>10%</td>
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<tr>
<td>Project*</td>
<td>15%</td>
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<tr>
<td>Tests (2)</td>
<td>40%</td>
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<tr>
<td>Final</td>
<td>25%</td>
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Collaboration Policy: You are free to talk with other students about the homework, computer exercises, and project. This includes discussing approaches to solving problems or projects, and discussing approaches to writing Matlab code necessary to solve problems or projects. All work submitted must be your individual effort. You may use Matlab code already published (e.g., on the web, in the “Student Manual” referenced above, etc.) provided that the code is properly referenced. However, you may NOT share Matlab code with other students in the course (or other WSU students, graduate students, etc.). Note that all students are submect to the WSU academic integrity policy available at www.conduct.wus.edu/default.asp?PageID=343.

Students with Disabilities: I am committed to providing assistance to help you be successful in this course. Reasonable accommodations are available for students with a documented disability. Please visit the Disability Resource Center (DRC) during the first two weeks of every semester to seek information or to qualify for accommodations. All accommodations MUST be approved through the DRC (Admin Annex Bldg, Rooms 205). Call 509 335 3417 to make an appointment with a disability counselor.

*The project, computer exercises, and some homework assignments will require use of a computer and Matlab.
EE 451 — Syllabus
Main Topics and Approximate Number of Lectures

0. Introduction (1 class; Text, Chapter 0)

1. Deterministic signal considerations:
   a. Review of AM, FM (Read: Text, Chapter 2.1-2.9)
   b. Basic digital signaling and pulse shaping (Read: Text, Chapter 4.4-4.5)

2. Brief Review of Probability and introduction to Random Processes (Read: Text, Chapter 1.1-1.11)

3. Binary symmetric channel; self-information; entropy; mutual information; Huffman codes. (Read: Text, Chapter 9.1-9.8; Approximate number of lectures = 3.)

4. Scalar Quantization PCM (Read: Text, Chapter 3.6–3.11; Approximate number of lectures = 1)

5. Error-Control Coding (Read: Text, Chapter 10.1-10.3; 10.5-10.6; Notes. Approximate number of lectures = 6)

   Test 1, Thursday, February 19 (tentative date)

6. Baseband Signaling, including PAM and partial response signaling (Read: Text, Chapter 4.1-4.10; Approximate number of lectures = 4)

7. Signal-Space Analysis (Read: Text, Chapter 5; Approximate number of lectures = 3)

   Test 2 Tuesday, March 31 (tentative date)

8. Combined coding and modulation (Read: Text, Chapter 10.7; Approximate number of lectures = 2)

9. Bandpass Signaling (Read: Text, Chapter 6; Approximate number of lectures = 4)

10. Spread-Spectrum Modulation (Read: Text, Chapter 7; Approximate number of lectures = optional topic to be covered if time permits)

   Final Exam, Thursday, May 7.