

## EE 303: Electronic Communication Systems And Digital Communications Spring 2009

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**Coordinator:** CDR Keith Kintzley ([kintzley@usna.edu](mailto:kintzley@usna.edu)), Maury rm. 249, x3-6180

**Website:** <http://www.usna.edu/Users/ee/kintzley/ee303sp09/index.htm>

**Text:** Frenzel, *Principles of Electronic Communication Systems*, 3<sup>rd</sup> ed.

**Course Purpose:** EE303 is the second in a two-part series of electrical engineering courses designed to give midshipmen the technical background necessary to understand communications equipment that they will undoubtedly encounter as commissioned officers.

**Course Objectives:** This course is designed to provide you the tools to:

1. Understand the basic components of a communications system and perform basic calculations involving gain and noise.
2. Understand how signals can be represented in the frequency domain and how tuned circuits operate as simple filters.
3. Demonstrate a working knowledge of amplitude modulation and frequency modulation.
4. Understand the binary representation of digital signals, basic Boolean arithmetic, and basic combinatorial and sequential logic elements.
5. Understand the advantages of digital communications and be familiar with analog-to-digital (A-D) and digital-to-analog (D-A) conversions.
6. Demonstrate a working knowledge of digital communication systems, modulation and multiplexing techniques, as well as error detection and correction.
7. Demonstrate a working knowledge of radio wave propagation and antennas, and the applicability of various frequencies to different types of transmissions.
8. Understand the fundamentals of microwave and satellite communications systems.

**Class Schedule.** This course meets three times a week; one hour on Monday, and two 2-hour blocks on Wednesday and Friday. Monday classes will be lecture and the 2-hour classes will typically be split between lecture and laboratory exercise. Each lesson has a reading assignment that is to be completed before class.

**EE302 and EE303.** Because EE303 is specifically for CS/IT majors, it does not cover computer networking. Exam 3 will be a comprehensive final exam and the course will end at the 12-week mark.

**Practical Exercises (PE).** PEs are designed to be completed in class and will primarily be performed at the laboratory stations although we will occasionally utilize classroom laptop computers. Reading PEs prior to class will greatly increase your understanding of the learning objectives covered. PEs may be worked individually or in groups at the instructor's discretion.

**Homework.** Homework is essential to your comprehension of the course material. A Problem Set (PS) will be assigned for each lesson as per the course syllabus and will be posted on the course website along with PS solutions. In accordance with the Honor Concept, collaboration on homework is permitted as "authorized assistance," however, *wholesale duplication* is not. In addition to properly documenting your work in homework solutions, any sources of outside assistance should be clearly cited. Homework is due at the beginning of each class following its assignment. Homework should be neatly completed **on green**

**engineering paper** (front side only) with problem numbers labeled, answers boxed, and appropriate units indicated.

**Exams and quizzes.** Three closed-book exams are scheduled during the semester as indicated by the syllabus. A calculator and a formula sheet (rules to be announced) may be used for each exam. Discussion of the contents of the exam with other students on the day of the exam is *strictly forbidden* and constitutes a violation of the Honor Concept. Quizzes will be administered throughout the semester. They may be closed or open-book, announced or unannounced.

**Lab Practical.** The lab practical will test your ability to properly build circuits and measure parameters. Familiarization with the lab bench equipment will be exercised through the PEs that are assigned prior to the administration of this test. The length and details of the test will be promulgated later.

**Calculation of course grade.** A weighted average grade will be calculated as follows:

Exam 1	20 %	<i>The instructor reserves the right to adjust your final grade based upon their evaluation of your overall course preparation and participation.</i>
Exam 2	20 %	
Exam 3 (final)	25 %	
Quiz	10 %	
PEs	10 %	
Homework	10 %	
Lab Practical	5 %	

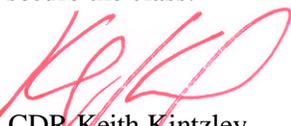
Letter grades will be assigned according to following table.

<b>Numerical score</b>	$\geq 90\%$	80% – 90%	70% – 80%	60% – 70%	$< 60\%$
<b>Letter grade</b>	A	B	C	D	F

**Calculators.** The use of electronic calculators will be permitted for all labs, homework, quizzes, and exams unless otherwise stated. You are required to bring a calculator to class each period. The calculator should, at a minimum, have the capabilities of the TI-68 (complex numbers, simultaneous equations, trigonometric functions, etc.). In the event of a calculator failure, manual calculation will be required. Sharing of calculators will not be permitted during examinations.

**Extra Instruction.** I am available for individual extra instruction during office hours or other mutually agreeable time. To prepare for EI, bring your notes, homework problems, and specific questions/problems with you to help identify trouble areas.

**Section Leader.** The Section Leader will be appointed by the instructor and will be responsible for taking attendance each class. The Section Leader will call the section to attention and report by name the individuals that are absent at the beginning of each class as well as calling the class to attention for dismissal at the end of the period. In the event that the instructor is late for class (in excess of 10 minutes), the Section Leader will contact the EE Dept. Office (x3-6150). Pending the arrival of someone to take charge of the class, the Section Leader will supervise the class in a study period, will collect any assignments due for that period, and will deliver them to the EE Dept. Office at the end of the period. Under no circumstances is the Section Leader to secure the class.

  
CDR Keith Kintzley  
EE303 Course Coordinator