

WEST VIRGINIA UNIVERSITY  
COLLEGE OF ENGINEERING AND MINERAL RESOURCES  
DEPARTMENT OF COMPUTER SCIENCE AND ELECTRICAL ENGINEERING

## EE 461 - Introduction to Communication Systems - Fall 2019

**Instructor:** Daryl Reynolds  
**Office:** AER 353  
**Phone:** 304-293-9134  
**Class Time:** MWF 2:00-2:50 in AGR 2010  
**Office Hours:** MF 10:00am-11:00am, W 12:30pm-1:30pm, after class, and by appointment  
**E-Mail:** daryl.reynolds@mail.wvu.edu (I may not see mix email)  
**Web Page:** eCampus. Check often.  
**Textbook:** *Modern Digital and Analog Communication Systems*, 4<sup>th</sup> Ed., by Lathi and Ding.  
**Prerequisite:**

- EE 329
- some knowledge of MATLAB will be helpful

### Course Topics

This course is designed to provide students with an understanding of the fundamentals of digital communications systems. The topics we will cover include:

- Characterization and analysis of signals
  - Signal spaces
  - Fourier transform
  - Sampling theorem
  - Degrees of freedom
  - Linear systems
- Digital passband modulation
  - Quantization
  - Digital modulation
  - Optimal receivers
- Noise and random processes
- Performance of uncoded digital communications in noise

- Elements of information theory
  - Data compression
  - Channel capacity and the promise of coding
  - Practical coding schemes

## Grading

Unannounced Quizzes	10%	
Matlab Projects	10%	
Exam 1	25 %	(10/4)
Exam 2	25 %	(11/15)
Final Exam	30%	

The instructor may curve the final grades at his discretion, but you are guaranteed at least the letter grade shown below if you obtain the corresponding score. No '+' or '-' grades will be reported.

A	90%
B	80%
C	70%
D	60%

## Homework Assignments and Quizzes

Homework assignments will be posted regularly, along with their solutions. Although discussing homework problems with your classmates is appropriate, **being able to solve homework problems on your own is essential for doing well in the class.** Homework will not be collected or graded. To encourage you to stay on top of your homework and also to motivate you to attend class, several short unannounced quizzes will be given in class. These quizzes will be similar in nature to the homework problems or related material presented in class. The quiz material will be restricted to topics covered in current and/or past homework assignments. The lowest quiz grade will be dropped at the end of the semester, but you are not permitted to make-up any missed quiz for any reason.

## **Electronics/Wearables in the Classroom**

The use of cell phones, smart wearable devices, laptops, or possession of other communication devices are strictly prohibited during exams, tests, or quizzes.

## **Missed Test/Quiz Policy**

You are expected to attend the exams and quizzes at the scheduled time and date. There are no makeup exams or quizzes. If you miss one mid-term exam, the associated grade percentage will be added to the final exam. If you miss a second mid-term exam, you will receive zero credit for the second exam or quiz. There is no makeup final exam. The only exceptions to this rule are "University Sanctioned Absences", i.e., mandatory military obligations, mandatory court appearances, and university activities at the request of university authorities.

## **Honor Code**

All work submitted for the exams should be your own unaided work. You may confer with your colleagues on interpretation and approach to homework problems (including the computer assignments), but *the solutions must be your own*. All code that you turn in for your computer assignments must be well documented and entirely your own work (except for code that was given to you by the instructor). As a rule of thumb, if you are sharing written work (through e-mail, for example), you are probably in violation of the honor code.

## **WVU Academic Integrity Statement**

"The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code at <http://www.arc.wvu.edu/admissions/integrity.html>. Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter."

## **Regrading**

If you believe the instructor has made a mistake or was unfair in grading, you may request a regrade. However, the request must be made in writing and submitted within one week of the return date of the assignment or exam. The decision to change the grade is entirely at the discretion of the instructor.

## **Attendance**

Attendance is strongly encouraged. Attendance will be recorded at random times throughout the semester and bonus points may be awarded at the discretion of the instructor. In any case, you will be responsible for all material covered in class, even if it is not in the textbook. You are also responsible for material posted on the course web page. It is your responsibility to make sure that all assignments are turned in on time and that you are aware of all announcements made in class. Please arrive to class on time.

## **Disclaimer**

The instructor reserves the right to make changes in the syllabus. Any changes that are made will be in, what the professor deems, the best interests of the class.