University of Texas at El Paso
Electrical and Computer Engineering
Digital Communications & Advance Dig. Comm.
EE4388 - EE5323, Spring 2020

INSTRUCTOR:	Virgilio Gonzalez
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OFFICE HOURS:	Mon, Wed: 2:00 PM – 3:30 PM, or by appointment
TEXTS:	Bernard Sklar, "*Digital Communications"*. **2nd Ed**, Prentice Hall. (other editions might be used with caution)

Course Outcomes

1. Analyze linear modulation, demodulation processes
2. Analyze Signal Space
3. Analyze Error Rate performance of digital communication systems
4. Implement Carrier and Symbol transmission
5. Implement computer, hardware and simulation tools.

Catalog Description

- Digital Communications (3-0) Techniques of sampling; digital baseband transmission; digital modulation schemes; introduction to coding and fundamental limits on system performance.
- Advanced Digital Communications (3-0) Source coding, generation, transmission, and detection of digital baseband and bandpass signals, optimum receivers, block and convolutional channel coding, adaptive equalization, encryption and decryption, and introduction to spread spectrum.

Content Material

Item #	Topic	Chapter Reading
1	Overview of Digital Communications	*
2	Signals and Spectra	1
3	Formatting and Baseband Modulation	2
4	Baseband Demodulation / Detection	3
5	Bandpass Modulation and Demodulation	4
6	Communications Link Analysis	5
7	Channel Coding: Part 1	6
8	Channel Coding: Part 2	7
9	Modulation and Coding trade-off	9
10	Synchronization	10
11	Spread Spectrum	12
12	Selected Topics along major chapters	*

* Correspond to supplementary material

GENERAL COURSE POLICIES

- Samples of student work will be collected for quality assurance purposes. Please notify the professor, in writing, if there is any confidentiality requirement.
- Most homework, Special Problems and other assignments will be solved online with **BlackBoard**.
- Each piece of written work must have **name,** students' last 4 digits **ID, TEAM** number (if applicable) at the **upper right corner** of the first page; and the **name** in all remaining pages.
- All printed work must be stapled, with good presentation. Final results must be emphasized (example red underline or highlighted box)
- Online work must have in the first text line the name of the student, students' last 4 digits ID, and the team number (when applicable).
- No late work will be accepted but special circumstances will be considered if reported on time and evidence for the justification is provided. Only one exception per semester per type of work will be accepted.
- Due dates for Lab assignments, homework, online quizzes, and exams will be notified with at least one week in advance.
- Some assignments will require computer simulations using tools available in the department. It is suggested that you install a copy on your own computer. MATLAB, LABVIEW. Others might need online access. More details will be given later.
- Detailed instructions for the **Labs** and other policies will be **provided later** in separate handouts and in **BlackBoard**

GRADING

ITEM	Points / Ea
Exams 1, 2, & 3	200
Team class discussions/problems	10
Homework / Quiz	10-20
Lab reports or special assignments (each)	30-60
PowerPoint presentations	100
Points given by instructor on student participation	0-20

- Each element will accumulate points
- Participation will be collected each class. If a student misses more than two sessions (6hrs) then the final grade will be "F". Justifications for more than two absences will only allow you to get a "W" in the class.
- Some elements are individual, and others depend on team performance
- **Show always all the procedure** to arrive to the solutions. End results without the right procedure are considered conceptual errors.
- In exams each problem has its own weight and will be indicated at the beginning of the problem, points are given by problem section (e.g. sections *a* and *b* of same problem have their own points).
- The grade of an exam answer will be 100% if correct and justified. 50% for non-conceptual procedural errors and 0% if no answer. There is a tolerance of ±20% based on the relevance of the errors. In some cases, to earn partial credit, the student will need to identify the reason for the errors, justify the correct answer and return test back for second grading.
- Graduate students are expected to perform at a higher level, therefore teams are smaller and presentation topics will be different.
- Labs and special problems have the grades Satisfactory (100%), Attempted (50%) or Unsatisfactory (0%) for the points available. Online quizzes are either "all or nothing" points.
- Letter scale will be **A:** 90%-100%; **B:** 80%-89.9%; **C:** 70%-79.9%; **D:** 60%-69.9%; **F:** below 60% of the reference grade.

Academic Honesty

- It is expected that the students will conduct with integrity in all course areas. Do not attempt to engage in a dishonest activity such as copying, plagiarism, falsifying information, etc. The professor will take measures to prevent such instances and will bring a case to the university authorities.
- Information about University wide policies could be found in the Dean of Students Web page at http://sa.utep.edu/osccr/academic-integrity/

TEAM Policies

- Some assignments will be reported in **teams of 2 or 3 students**. However there is always an individual evaluation for each activity. **Teams could be self selected.**
- PowerPoint presentation will be in **groups of 2 or 3 students.**
- All members ***must contribute*** for each assignment and need to show their own part in the team's report.