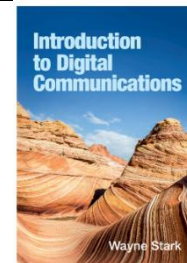


**University of Texas at El Paso**  
**Electrical and Computer Engineering**  
**Digital Communications & Advance Dig. Comm.**  
**ECE4335/5335/6335, Fall 2023**

INSTRUCTOR:	Virgilio Gonzalez
OFFICE:	Engineering Annex A333
PHONE:	915 747 6622
EMAIL:	<a href="mailto:Vgonzalez3@utep.edu">Vgonzalez3@utep.edu</a> ;
OFFICE HOURS:	T 3:00 – 4:00 PM, W 4:30 PM – 5:30 PM, or by appointment
Prerequisites	EE 3353 or ECE3331, EE 3384 or ECE3332
TEXTS:	Title: Introduction to Digital Communications Author: Wayne Stark Edition: 1 <sup>st</sup> ; Cambridge University Press (2023)



**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	Communication Networks	*
2	Fundamentals of Digital Communications	1
3	Modulation and Demodulation	2
4	Probability and Signals	3
5	Errors	4
6	Optimal Receivers	5
7	Modulation Techniques	6
8	Wireless Channels	7
9	Coding	8, 9
10	Selected Topics along major chapters	*

\* Correspond to supplementary material

### GENERAL COURSE POLICIES

- For email questions or concerns, please start the email subject line with the course , such as “**ECE4335: ...** topic for email” .
- 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
Exams 1, 2, & 3	200/ea
Team class discussions/problems	100
Lab reports or special assignments	150
PowerPoint presentations	150
Points given by instructor on student participation	0-20

- Each element will accumulate points
- 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  $\pm 20\%$  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**

- Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) for possible disciplinary action. To learn more, please visit HOOP: Student Conduct and Discipline..
- Information about University wide policies could be found in the Dean of Students Web page at <http://studentaffairs.utep.edu/Default.aspx?alias=studentaffairs.utep.edu/dos>

### **AI allowed with proper acknowledgement**

Use of AI technologies or automated tools, particularly generative AI such as [ChatGPT](#) or [DALL-E](#), is **only allowed with proper attribution given for its use.**

Students must properly cite and give full credit to the program used upon submission of every relevant assignment. For example, text generated using ChatGPT must be cited:

Chat-GPT(version). Date of query (year/month/day). "Text of your query."  
Generated using OpenAI. <https://chat.openai.com/>

A short paragraph describing how the tool(s) was/were used for the assignment must be included.

### **Accommodations and NETiquette**

- NETtiquette
  - Always consider audience. Remember that members of the class and the instructor will be reading any postings.
  - Respect and courtesy must be provided to classmates and to instructor at all times. No harassment or inappropriate postings will be tolerated.
  - When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a F2F situation.
  - Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space. If students wish to do so, they have the ethical obligation to first request the permission of the writer(s).
- The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services.

## STUDENT RESOURCES

UTEP provides a variety of student services and support:

- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.
- [History Tutoring Center \(HTC\)](#): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- [Military Student Success Center](#): UTEP welcomes military-affiliated students to its degree programs, and the Military Student Success Center and its dedicated staff (many of whom are veterans and students themselves) are here to help personnel in any branch of service to reach their educational goals.
- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

### 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.