Communications Systems
CSCE 3020, Section 001
Spring 2026

Class Timings: Monday and Wednesday, 7:00 PM – 8:20 PM, Discovery Park NTDP D201

Instructor: Fernando Mosquera, Email: Fernando.mosqueraferrandiz@unt.edu Student hours: E235H**,** Tuesday and Thursday 2:00 PM – 4:00 PM or by appointment.

Teaching Assistants:

Name: Shouzhe Zhang.
Email: ShouzheZhang@my.unt.edu
Student hours: Friday, 10 AM - 12 PM at F268

Course Webpage: All the course related material will be posted on the course webpage which is available through Canvas (https://unt.instructure.com/)

Course Description:

The objective of this course is to introduce the concepts of transmission of information via communication channels. Topics such sampling and signal processing, and amplitude and angle modulation, frequency response analysis and pole-zero plots and filter design will be discussed. MATLAB software will be used as a teaching tool.

Course Outcomes:

- Analyze the frequency response of communication systems.
- Represent continuous-time signals by samples.
- Determine the energy and power spectral density of signals.
- Plot pole-zero diagrams.
- Design analog and digital filters.

Program Outcome Mapping:

- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

Textbook: *Signals and Systems: Analysis Using Transform Methods and MATLAB*, 2nd edition, M. J. Roberts, McGraw Hill, 2012, ISBN 978-0-07-338068-1.
Supplemental text: MATLAB Student Edition

Catalog Description:
Introduction to the concepts of analysis and design of communication system components using signal analysis techniques. Amplitude and angle modulation for the transmission of continuous-time signals. Introduction to analog and digital filter design and analysis.

Prerequisite(s): CSCE 3010 with a grade of C or better
Topics:

- Sampling and Signal Processing
- Frequency Response Analysis
- Communication Systems Analysis
- Laplace System Analysis
- z-Transform System Analysis
- Filter analysis and Design

Grading:

Attendance (Class Activity)	10%
Homework	10%
MATLAB Projects	15%
Lab Projects (Recitations LABs)	15%
Midterm Exam	20%
Final Exam	25%

Attendance (Class Activity): There will be several class activities during the class session that will reinforce the concepts that we learned in the class. These class activities will be scheduled during the class timing.

Homework: Homework will be in the form of problem sets with a due date **one week** after it is assigned. **No late homework will be accepted.** Homework must be done individually (you will learn the most from this). Any evidence of group participation or direct copying from sources like previous year's solutions, textbook, solutions, Wikipedia, websites, and other sources will be interpreted as academic dishonesty. Using AI (Artificial Intelligence) assisted websites to generate or auto generate solutions will also be interpreted as academic dishonesty. There will be five to six homework assignments.

MATLAB Projects: MATLAB Projects will be in the form of problem sets to use with MATLAB software with a due date **one week** after it is assigned. No late homework will be accepted. MATLAB Projects must be done individually (you will learn the most from this). Any evidence of group participation or direct copying from sources like previous year's solutions, textbook, solutions, Wikipedia, websites, and other sources will be interpreted as academic dishonesty. Using AI (Artificial Intelligence) assisted websites to generate or auto generate solutions will also be interpreted as academic dishonesty. There will be three or four MATLAB Projects.

Lab Projects: Recitations: There will be recitations throughout the week. The TA will be available at that time to help you with the Lab Projects and any other assignment in general. For the Lab project the students will use MATLAB Simulink. There will be three Lab Projects.

Recitation Labs:

- Section 201 at NTDP F210 Fr 1:30 PM - 2:20 PM
- Section 201 at NTDP F210 Fr 12:30 PM - 1:20 PM

Exams: There will be a **midterm exam** and a **final exam**. The exams are closed books and closed internet. Mobiles phones are not permitted and browsing the internet is not allowed. Please make sure you have a simple calculator (not a programmable calculator) to take the exams. Exams will include material from the modules, the readings, homework, and labs and should be taken individually and not as a team.

- **Midterm Exam:** Monday, March 2nd, 2026, 7:00 PM – 8:20 PM, NTDP D201
- **Final Exam:** Monday, May 4th, 2026, 8:00 PM – 10:00 PM. NTDP D201

Missing Classes, Assignments, or Exams: Attendance at all exams is mandatory. Throughout the semester, a student may miss classes or exams due to many reasons. Most of the reasons will not be accepted as an "excused" absence. Assignments or exams can be made-up only under extraordinary circumstances and only when notification is given to me before the assessment or exam is administered. Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course. It is important that you communicate with the professor and the instructional team prior to being absent, so you, the professor, and the instructional team can discuss and mitigate the impact of the absence on your attainment of course learning goals. Please inform the professor and instructional team if you are unable to attend class meetings because you are ill, in mindfulness of the health and safety of everyone in our community. A no-show for an assessment or exam without prior notification and a verifiable excuse (appropriate official documentation) will result in a grade of zero (0) for that assessment or exam.

Safety Procedures and Guidelines: While working in recitation sessions, students are required to follow proper safety procedures and guidelines in all activities requiring lifting, climbing, walking on slippery surfaces, using equipment and tools, handling chemical solutions and hot and cold products. Students should be aware that UNT is not liable for injuries incurred while students are participating in class activities. All students are encouraged to secure adequate insurance coverage in the event of accidental injury. Students who do not have insurance coverage should consider obtaining Student Health Insurance. Brochures for student insurance are available in the UNT Student Health and Wellness Center. Students who are injured during class activities may seek medical attention at the Student Health and Wellness Center at rates that are reduced compared to other medical facilities. If students have an insurance plan other than Student Health Insurance at UNT, they should be sure that the plan covers treatment at this facility. If students choose not to go to the UNT Student Health and Wellness Center, they may be transported to an emergency room at a local hospital. Students are responsible for expenses incurred there.

Disputing Grades: If you have a dispute with how an assignment or exam is graded, you should get the solution to the assignment, quiz, or exam off the course web site and examine it. If you really believe that your answer is correct (matches the answer given in the solution), contact the grader and discuss it with him. The grader will listen to your concern, and act on it, at their discretion. In any case, they will re-grade the assignment and will communicate with you. Note that instructor or grader addition errors should follow the above procedure. Assignment, exam, and homework grades are disputable for **one week** from the day the grades were posted on Canvas.

Class Policies: Please note that portable phones, pagers, and late arrivals are disruptive to the instructor and to your peers. The use of cell phones, beepers, or communication devices is disruptive and is therefore absolutely prohibited during class and exams. Turn off your cell phone while in class and while taking exams. If I catch you using these devices in the class or during the exams, the penalty can range from a formal warning to an 'F' for the course and you will be asked to leave the class. Except in emergencies, students using such devices must leave the classroom for the remainder of the class period. I know that some of you may wish to take notes directly on your computer and I have no problem with that. If, however, you choose to access your email, search the web, play games, or instant messenger your friends during class, you will have 10% deducted from your final grade for each transgression. A nonprogrammable calculator is required for all class meetings and exams. If I am late arriving to class, it will be because of circumstances beyond my control. You are expected to remain 20 minutes past the scheduled class start time while I attempt to communicate my situation and relay instructions.

Syllabus Revisions: I reserve the right to modify the syllabus, course policies, the course calendar, assignment and its grade points, and due dates. Notice of such changes will be by email or announcement in class.

Course Policies: You are expected to spend at least 10 hours per week for this course. Keep all your graded assignments, quizzes, and tests for study and review. You should track your own progress on Canvas and be aware of current grades throughout the term. If you would like to look at the graded assignments, meet me during my office hours or setup an appointment. Final grading will be done as follows. A: >= 90%, B: >= 80% and < 90%, C: >= 70% and < 80%, D: >= 60% and < 70% and F: < 60%. Grades will be curved if necessary. Grades cannot be changed after they have been electronically entered into university's system except for instructor errors. Any extenuating circumstances that may adversely affect your grade must be brought to my attention before the final course grades are recorded. To be considered, such circumstances must be unusual, unavoidable, and verifiable.

Disability Services/Special Needs: UNT complies with all federal and state laws and regulations regarding discrimination including the Americans with Disability Act of 1990 (ADA). If you have a disability and need reasonable accommodation for equal access to education or services, please contact the Office of Disability Accommodation. Please initiate this process and inform me during the first two weeks of class.

Academic Dishonesty: All the provisions of the University code of academic integrity apply to this course. In addition, it is my understanding and expectation that when you submit any test, exam, or assignment it means that you neither gave nor received unauthorized aid. For homework and programming assignments, while discussion is allowed, direct copying is not, and students must turn in individual submissions. Using AI (Artificial Intelligence) assisted websites to generate or auto generate solutions will also be interpreted as academic dishonesty. All students are required to know, observe, and help enforce the UNT Code of Student Academic Integrity. Cheating will result in disciplinary action according to UNT Policy 06.003. The penalty for a first offense can range from a formal warning to an 'F' for the course. Regardless of the penalty imposed, a record of the offense will be kept in the Office of the Dean of Students.

All department policies on Academic Integrity and Student Conduct apply for this course these are available at the following link: https://engineering.unt.edu/cse/students/resources/academic-integrity.html

Any exceptions to these guidelines are noted explicitly in the syllabus

Student Perceptions of Teaching (SPOT): Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The short SPOT survey will be made available during the last week of classes to provide you with an opportunity to evaluate how this course is taught.

ABET Survey: Towards the end of the course, the students will be asked to do an ABET exit survey which will help instructors to quantitively measure whether the students met the course outcomes stated in the course syllabus. This survey will be conducted during the last week of classes.

Tentative Course Schedule *(subject to change):*

	Week	Lecture	Remarks
1	1/12 - 1/14	Syllabus [CH1] Review Signals and Systems	**No Recitation LAB**
2	**1/19** - 1/21	**Martin Luther King Jr. Day (No Class)** [CH10] Sampling and Signal Processing	**No Recitation LAB**
3	1/26 - 1/28	[CH10] Sampling and Signal Processing (Cont.)	
4	2/2 - 2/4	[CH11] Frequence Response Analysis	Homework CH10
5	2/9- 2/11	**[**CH11] Frequence Response Analysis (Cont.)	MATLAB Project CH10
6	2/16 - 2/18	[CH12] Communication System Analysis	Homework CH11 MATLAB Project CH11
7	2/23 - 2/25	[CH12] Communication System Analysis (Cont.) **Exam Review**	Homework CH12 MATLAB Project CH12
8	3/2 - 3/4	**Midterm Exam,** [CH13] Laplace System Analysis	
9	3/9 – 3/11	**Spring Break**	**No Recitation LAB**
10	3/16 - 3/18	[CH13] Laplace System Analysis (Cont.)	
11	3/23 - 3/25	[CH13] Laplace System Analysis (Cont.)	Lab Project 1
12	3/30 - 4/1	[CH14] z-Transform System Analysis	Homework CH13
13	4/6 - 4/8	[CH14] z-Transform System Analysis (Cont.)	Lab Project 2
14	4/13 - 4/15	[CH15] Filter Analysis and Design	Homework CH14
15	4/20 - 4/22	[CH15] Filter Analysis and Design (Cont.)	Lab Project 3
16	4/27 - 4/29	**Exam Review**	Homework CH15 **No Recitation LAB**
17	**Monday 5/4/2026**	**8:00 PM to 10:00 PM in NTDP D201**	**Final Exam**