Introduction to Computer Architecture
CSCE 3610, Section 001
Spring 2026

Class Timings: Monday and Wednesday 4:00 PM – 5:20 PM, NTDP D212

Instructor: Dr. Mosquera (Email: fernando.mosqueraferrandiz@unt.edu , Office: NTDP E235H, Student hours: Tuesday and Thursday 2:00 PM – 4:00 PM or by appointment)

Teaching Assistant:

TA/IA: Sai Rathan Perala(SaiRathanPerala@my.unt.edu)
Student Hours Location: Zoom https://unt.zoom.us/j/88045134451
Student Hours: Wednesday 10:00 AM - 2:00 PM

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

Course Outcomes:

- Design ALUs to perform integer and floating-point arithmetic including addition, subtraction, multiplication, and division.
- Design a simple processor, pipelined processor, and co-processor using VHDL.
- Apply compiler techniques to improve program performance.
- Evaluate cache memories and various cache design alternatives.
- Describe input-output systems and interrupts by writing simple interrupt handlers.

Program Outcome Mapping:

- 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
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Text:

- Computer Organization & Design, ARM Edition, 5th edition by Patterson and Hennessy, Morgan Kaufmann, ISBN 9780124077263
- Computer Architecture w/CD, 5th edition, Hennessy, Morgan Kaufmann Publishers, ISBN 9780123838728
- The Designer's Guide to VHDL, 3rd edition, Peter Ashenden, Morgan Kaufmann, 2008, ISBN 9780120887859

Catalog Description: Prerequisite: CSCE 2610. Design of simple and pipelined processor, introduction to co-processor and its design, techniques to improve performance, memory hierarchy, cache memories, input-output system, and interrupts.

Topics:

- Fundamentals of Digital Logic
- Combinational Circuits
- Processor design
- Coprocessor design
- Improving performance
- Cache memory
- Input-output Systems

Grading:

Homework	12%
Quizzes	12%
In-Class Activity	5%
Lab assignments	20%
Midterm Exam (3/2/2026)	21%
Comprehensive Final Exam (5/2/2026)	30%

Homework: Homework will be in the form of problem sets with a due date one week after it is assigned. Homework will be assigned on Tuesdays as per the schedule. **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 unauthorized sources (Example: previous year's solutions, textbook solutions, Wikipedia, and websites) will be interpreted as academic dishonesty. There will be six to seven homework assignments.

Quizzes: There will be six to seven pop quizzes given throughout the semester. The pop quizzes can be given any time during the class. These will be to reward students who consistently show up to class but will be more than just attendance points.

In-class Activity: There will be five to six in-class activity that will reinforce the concepts that we learned in the class. These in-class activities will be scheduled during the class timing.

Lab Assignments: Lab assignments are an integral part of the course and are intended to provide hands-on experience in the application of the design techniques discussed in lecture. Lab assignments will be assigned on Thursdays as per the schedule and with a due date of two weeks after it is assigned. There will be five to six lab assignments assigned. Lab assignments must be done individually and can be done in NTDP F243/F270. Any evidence of group participation will be interpreted as academic dishonesty.

Exams: There will be a midterm exam and a final exam. Mobiles phones are not permitted. Exams will include material from the lecture, the readings, homework, and lab assignments. **Final exam will be comprehensive**. Exam dates are:

- **Midterm Exam:** Monday, March 2nd, 2026 4:00 PM – 5:20 PM, NTDP D212
- **Final Exam:** Saturday, May 2nd, 2026 12:30 PM – 2:30 PM, NTDP D212

Missing Classes/Assignments/Exams: Attendance at all exams is mandatory. Throughout the semester, a student may miss classes, assignments, quizzes, or exams due to many reasons. Most of the reasons will not be accepted as an "excused" absence. Assignments, quizzes, or exams can be made-up only under extraordinary circumstances and only when notification is given to me before the quiz or exam is administered. A no-show for a quiz or exam without prior notification and a verifiable excuse (appropriate official documentation) results in a grade of zero for that quiz or exam.

Disputing Grades: If you have a dispute with how an assignment, quiz, or exam is graded, you should get the solution to the lab assignment, quiz, or exam off the class 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 sign the assignment verifying that they saw it again. The lab assignments will not have solutions posted, so contact the grader for disputing the grade if you have met all the requirements of the lab assignment and you have lost points. Note that instructor or grader addition errors should follow the above procedure. Assignment, quiz, exam, and homework grades are disputable for **one week** from the day the grades were assigned 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. Turn off your cell phone while in class. If I catch you using these devices, your final grade will be reduced by 10 points for each and every transgression 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 solitaire or other games, or instant messenger your friends during class, you will have 10 points deducted from your final grade for each and every transgression. This penalty will be at the sole discretion of the instructor. If I am late arriving to class, it will be because of circumstances beyond my control. You are expected to remain for 20 minutes past the scheduled class start time while I attempt to communicate my situation and relay instructions.

Syllabus Revisions: This syllabus may be modified as the course progresses. 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 semester. I will make all the effort to return the graded assignments, but it's your responsibility to collect back the graded assignments from the grader or the instructor if it is not given back to you. 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 the university's system except for instructor error. 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 a 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 your signature on any test or assignment means that you neither gave nor received unauthorized aid. For homework and lab assignments, while discussion is allowed, direct copying is not, and students must turn in individual submissions. 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 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 administered during the last week of classes.

Tentative Class Schedule:

	Week	Lecture	Assignments Due / Comment
1	1/12 - 1/14	Syllabus, Fundamentals of digital logic	
2	**1/19** - 1/21	**Martin Luther King Jr. Day (No Class)** Fundamentals of digital logic	
3	1/26 - 1/28	Combinational Circuits	Homework 1
4	2/2 - 2/4	Combinational Circuits	Lab 1
5	2/9 - 2/11	Processor design	Homework 2
6	2/16 - 2/18	Processor design	Lab 2
7	2/23 - 2/25	Processor design/Review	Homework 3
8	**3/2** - 3/4	**Midterm Exam** Coprocessor design	**Midterm Exam**
9	**3/9 – 3/11**	**Spring Break**	**UNT Closed**
10	3/16 - 3/18	Coprocessor design	
11	3/23 - 3/25	Improving performance	Lab 3
12	3/30 - 4/1	Improving performance	Homework 4
13	4/6 - 4/8	Cache memory	Lab 4
14	4/13 - 4/15	Cache memory	Homework 5
15	4/20 – 4/22	Input-output Systems	Lab 5
16	4/27 -4/29	Input-output Systems/Review	
17	**SATUDAY 5/2/2026**	**12:30 PM - 2:30 PM in NTDP B158**	**Comprehensive Final Exam**