

University of North Texas, College of Engineering  
Department of Electrical Engineering  
**EE2710: Digital Logic Design**

Section 4: 3 Credit Hours Fall 2020

<b>Instructor:</b>	Dr. Edgard Muñoz-Coreas
<b>Office Hours:</b>	Tuesday/Thursday 7:30-8:30pm. Remote (Zoom)
<b>Contact:</b>	Edgard.Munoz-coreas@unt.edu
<b>Lecture:</b>	Tuesday-Thursday 5:30-6:50pm Remote (Zoom)
<b>Teaching Assistant:</b>	TBD
<b>TA Office Hours:</b>	TBD

### **Description:**

The purpose of this course is to introduce you to digital computers and information processing systems. This course covers boolean algebra, principles and methodology of logic design, combinatorial circuit design, state elements and sequential logic circuits.

### **Prerequisite(s)**

Engineering or engineering technology majors.

### **Corequisite(s)**

EENG 2711 (which must be completed with a grade of C or better) for Biomedical Engineering (Bioinstrumentation track), Computer Engineering, and Electrical Engineering majors.

### **Textbook (required)**

Fundamentals of Logic Design, 7th Enh. Ed., C. H. Roth Jr., L. L. Kinney, and E. B. John, Cengage Learning, Inc., 2021. ISBN: 978-1-337-62035-2. <https://www.cengage.com/c/fundamentals-of-logic-design-enhanced-edition-7e-roth-jr/9781337620352/>

Additional material, as required, shall be provided on Canvas.

### **Course Topics**

- Number Systems and Digital Logic Gates
- Boolean Algebra, Switching Functions and Canonical Forms
- Combinational Circuit Minimization, Analysis, and Synthesis
- Sequential circuits elements and sequential logic circuits
- Modular Sequential Logic, Counters and shift registers
- Analysis and Design of synchronous sequential circuits

### **Learning Objectives:**

The objective of this course is that, by course's end, the student should be able to:

1. Identify a digital systems and understand its advantages. Differentiate a digital system from an analog one.
2. Know non-decimal radix number systems, radix arithmetic and Boolean algebraic principles.
3. Utilize Boolean algebra to the design and simplification of digital logic.
4. Analyze and synthesize combinatorial logic systems
5. Analyze and synthesize sequential logic systems
6. Given problem requirements, identify and design a complete digital system from basic building blocks.

### **Course Learning Outcomes**

The Learning Outcomes for this course are as follows:

1. Digital and Analog Systems: Basic Concepts and Historical Perspective
2. Number Systems and Digital Logic Gates
3. Boolean Algebra, Switching Functions and Canonical Forms
4. Combinational Circuit Minimization, Analysis, and Synthesis
5. Sequential circuit elements and sequential logic circuits
6. Modular Sequential Logic, Counters and shift registers

## 7. Analysis and Design of synchronous sequential circuits

These objectives correspond to ABET Criterion 3. Student Outcomes items 1 and 7 which are as follows:

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

### Canvas

All course interaction shall be through Canvas. Course materials shall be provided through canvas. All assignments and examinations shall be delivered through Canvas.

Students should immediately report any technical problems to the UNT University Information Technology Student Help Desk (helpdesk@unt.edu or 940.565.2324) as well as the instructor. The instructor and the UNT University Information Technology Student Help Desk Team will work with the student to resolve any issues at the earliest possible time.

### Grading

The Grading scale for this course is as follows:

F	D	C	B	A
$\leq 59.99\%$	60.00% - 69.99%	70.00% - 79.99%	80.00% - 89.99%	$90.00\% \leq$

The grading breakdown for this course is as follows:

Breakdown of Grading	
Midterms (2):	50% (25% apiece)
Final:	30%
Homework:	20%

Grading procedure for the course is outlined as followed:

- Homework shall be graded using the scale shown in Table . No curving shall be applied.
- Examinations shall be graded using the scale shown in Table . Individual test scores shall not be curved. Any curving shall be applied to the final grade as outlined shortly.
- The class mean for each examination shall be reported. *Students who scores are at or above the examination mean should not worry that they failed the examination.*
- Students with no more than two unexcused absences from lecture shall receive 1% extra credit on their final grade. Duration of attendance and number of missed lectures shall be used in determining if a student qualifies for extra credit. *No other extra credit will be offered in this class.*

### Additional Comments

Any and all curving shall be applied to the final raw score for the course. The final raw score shall be calculated as follows:

$$Grade = (Midterm_1 + Midterm_2) \cdot 0.5 + Final \cdot 0.3 + Homework \cdot .2 + 0.01 \cdot Attendance \quad (1)$$

*Students who (i) have examination scores at or above the reported means and (ii) achieve high marks on homework and attendance should not worry about failing to meet degree or program grade requirements for this course.*

### Course Policies

Any and all ADA accommodations shall supersede these policies where applicable.

#### Homework

Homework shall be returned no later than one week after the due date. Worked solution sets shall be made available for review no later than one week after the due date and no sooner than three days after the due date. *Homework is due before the beginning of class on the due date.* Homework submitted one day late will be penalized 50%. Homework submitted two or more days late will receive a zero. *Excuses for homework shall be permitted only for excused absences outlined in UNT policy 06.039.* After an assignment is returned, you have up to two weeks to contest any grade issues.

#### Communication

All email communications to the Instructors (TA and Professor) shall include the course name and section number in the subject line. This guarantees your messages shall not be dismissed as spam. The instructors shall only respond to messages from UNT email accounts.

### **Midterm and Final Examinations**

Since we are remote, all examinations shall be treated as timed take home tests. This means examinations shall be open-book and open-notes. Examinations shall take place during regular class time. Students shall have the whole 1 hour and 30 minutes to complete the examination.

Examination grades shall be returned as soon as possible after the completion of the test. A worked solution to a version of the examination shall be provided no earlier than two days after all students have taken the examination. There shall be a pre-examination review for each test. The review shall take place before the examination during either (i) regular class time and/or (ii) the regularly scheduled office hours. *Excuses for examinations shall be permitted only for excused absences outlined in UNT policy 06.039 and/or ADA accommodations.* After an examination is returned, you have up to two weeks to contest any grade issues.

Since we are remote, students are strongly encouraged to retain copies of examinations until grades are returned. In the event of technical issues please inform the instructor right away. Test submissions not turned in through Canvas shall require proof that the submission file was last modified before the testing time closed.

### **Attendance Policy**

All students are strongly encouraged to attend lecture. The remote Lectures shall not be recorded. Annotated copies of any materials handwritten or presented shall be made available on Canvas no more than 1 week after a given lecture. Students with no more than two unexcused absences from lecture shall receive 1% extra credit on their final grade. All excused absences are outlined in UNT policy 06.039.

All students are asked to please make sure your Zoom ID includes your first and last name. *Zoom IDs that use nicknames, aliases, device names, etc. shall be assumed to not be an enrolled student in the course and not allowed into the lecture meeting.*

For the inevitable technical issue, students should immediately notify UNT University Information Technology Student Help Desk (helpdesk@unt.edu or 940.565.2324) as well as the instructor. The instructor and the UNT University Information Technology Student Help Desk Team will work with the student to resolve any issues at the earliest possible time.

### **Course Evaluation**

Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course.

Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the SPOT website (<http://spot.unt.edu/>) or email [spot@unt.edu](mailto:spot@unt.edu).

### **Academic Integrity Standards and Consequences**

According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. *Pursuant to UNT policy 06.003, Students found guilty of academic dishonesty shall receive a F for the course and may be subject to additional discipline.*

### **ADA Accommodation Statement**

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. *Students may request accommodations at any time*, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at [disability.unt.edu](http://disability.unt.edu).

### **Emergency Notification & Procedures**

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university

closure, please refer to Canvas for contingency plans for covering course materials.

## **Sexual Assault Prevention**

UNT is committed to providing a safe learning environment free of all forms of sexual misconduct, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex, and therefore prohibit sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking, and/or sexual assault, there are campus resources available to provide support and assistance. UNT's Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim's compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at [SurvivorAdvocate@unt.edu](mailto:SurvivorAdvocate@unt.edu) or by calling the Dean of Students Office at 940-565- 2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at [oeo@unt.edu](mailto:oeo@unt.edu) or at (940) 565 2759.

*Employees who, in the course and scope of their authorized duties, witness or receive information regarding the occurrence of an incident that the employee reasonably believes constitutes sexual misconduct and is alleged to have been committed by or against a person who was a student enrolled at or an employee of the institution at the time of the incident shall promptly report the incident to the Title IX Coordinator in the Office of Equal Opportunity or a deputy Title IX Coordinator. The report must include all information concerning the incident known to the reporting person that is relevant to the investigation and, if applicable, redress of the incident, including whether an alleged victim has expressed a desire for confidentiality in reporting the incident. For additional details please see UNT policies 16.005 and 16.007*

## **Class Recordings & Student Likenesses**

Class recordings are the intellectual property of the university or instructor and are reserved for use only by students in this class and only for educational purposes. Students may not post or otherwise share the recordings outside the class, or outside the Canvas Learning Management System, in any form. Failing to follow this restriction is a violation of the UNT Code of Student Conduct and could lead to disciplinary action.