

EENG 4740.011/5940.011/5940.611 Digital Design Techniques
Course Syllabus
FALL 2025
University of North Texas
Electrical Engineering

Date Prepared: Aug. 11, 2025

Prepared by: Elias Kougianos

Instructor: Elias Kougianos

Office: F140

Office Hours: TuTh 2:30PM—4:00 PM in F140

Phone: 940-891-6708

Email: Elias.Kougianos@unt.edu

Course web site: <http://canvas.unt.edu>

Time: TuTh 4:00PM—5:20PM

Meeting Place: NTDP B142

Course Number, Title, Credit Hours:

EENG 4740.001/5940.011/5940.611 Digital Design Techniques, 3 Credit Hours

Course Description:

Three semester credit hours. Study of modern digital circuit implementation technologies, with emphasis on Field-Programmable Gate Arrays (FPGAs). Traditional and computer-based digital synthesis techniques for combinational and sequential circuits are covered. Complex systems, such as reaction timers, processors and buses, are built from simpler circuits. A modern hardware description language, such as Verilog or VHDL, is used throughout the course.

Prerequisite(s): EENG 2710 (Digital Logic Design), and EENG 2711 (Digital Logic Design Lab).

Course Topics:

- Introduction – Design concepts and the design process.
- Review of digital design techniques.
- Introduction to the Verilog Hardware Description Language.
- Implementation technology.
- Optimized implementation of logic functions.
- Combinational circuit building block design in Verilog.
- Synchronous sequential circuits in Verilog.
- Algorithmic State Machines (ASMs) and Finite State Machines with Datapath (FSMDs). Design and implementation in Verilog.
- Digital system design examples using CAD tools and Verilog.
- Asynchronous sequential circuits.
- Testing, validation, and verification of digital systems using Verilog.

Textbook(s) and/or required material:

- Fundamentals of Digital Logic with Verilog Design, 3rd Ed., Brown, Stephen and Vranesic, Zvonko, McGraw Hill, 2013, ISBN-10 0073380547, ISBN-13 978-0073380544
- Additional material will be provided during the course and will be available on Canvas. A Verilog simulator, such as Intel FPGA Modelsim (Starter Edition) will be used throughout the course. The software is available free of charge from:
<https://www.intel.com/content/www/us/en/programmable/downloads/download-center.html>

Grading:

- Exam 1: 33.33%[†]
- Exam 2: 33.33%[†]
- Exam 3: 33.33%[†]

[†]: The exams will differ for undergraduate and graduate students. Students enrolled in EENG5940.611 (Grad Track) are considered graduate students.

Grading scale (based on total course points):

90% - 100%	A
80% - 89.99%	B
70% - 79.99%	C
60% - 69.99%	D
00% - 59.99%	F

NOTES:

The exam schedule is as follows:

Test 1 is on Thursday September 18th (Week 5) in NTDP B142*

Test 2 is on Thursday October 23rd (Week 10) in NTDP B142*

Test 3 is on Thursday December 4th (Week 15) in NTDP B142*

There is no final exam for the course.

* Students with preapproved ODA arrangements will take all tests at the ODA Test Center

During each test you can consult a printout of the Canvas slides and any other pre-approved handouts (they will be announced prior to the tests). No notes, textbooks or other material. During tests the use of electronic devices such as cell phones, smart phones, smart watches, pagers, photographic devices and/or other electronic or communication devices, with the exception of calculators, is strictly prohibited. Such devices must be turned off during the tests. You may also be asked to leave your backpacks by the classroom door.

Missed Exams:

You will be allowed to make up a missed exam only if you have a documented university excused absence and received prior approval. For more details visit the UNT Dean of Students' web page: <https://deanofstudents.unt.edu/resources>

Homework:

Homework will be assigned regularly but will not be collected or graded. Solutions will be provided on Canvas and will be discussed in class.

Grade-related policies:

Turnaround Time

I aim to return graded work (tests) to you within one week of the test date. When this is not possible, I will send an announcement to the class.

Grade Disputes

You are required to wait 24 hours before contacting me to dispute a grade. Within that time, I expect that you will review the assignment details and reflect on the quality of the work you turned in. **You should then contact me to arrange a meeting to discuss the issue.** You should come to our scheduled meeting with specific examples that demonstrate that you earned a higher grade than you received. If you miss your scheduled meeting, you forfeit your right to a grade dispute. If you do not contact me to schedule a meeting within seven days of receiving your grade, you also forfeit your right to a grade dispute.

Extra Credit

There are no extra credit opportunities in this course.

Academic Dishonesty:

Cheating will not be tolerated. Anyone found guilty of cheating on a test or assignment will be awarded an F grade for the course. Discussions of problems and assignment with your classmates is welcome and encouraged, however, sharing of solutions is not. If you need help, you should ask the instructor. Cheating includes, but is not limited to, all forms of plagiarism and misrepresentation. For your rights and responsibilities please refer to <http://www.unt.edu/csrr>

Disabilities Accommodation:

The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Access at 940-565-4323 **during the first week of class**. Information and requests for supporting letters can be obtained from: <https://disability.unt.edu/>

Additional Policies and Procedures:

1. Attendance is mandatory. **5 or more absences will result in an automatic letter grade drop.** If you know ahead of time that you will miss a class, contact me via email in advance. Attendance will be spot checked. When checked, attendance will be taken at random times. If you are not present when your name is called, you will be counted as absent even if you come to class afterwards. For COVID-19 cases, see the statement below.
2. State common law and federal copyright laws protect my lectures. They are my own original expression. Whereas you are authorized to take notes in class thereby creating a derivative work from my lecture, the authorization extends only to making one set of notes for your own personal use and no other use. You are not authorized to record my lectures, to provide your notes to anyone else or to make any commercial use of them without expressed prior permission from me. Synchronous (live) sessions in this course will be recorded for students enrolled in this class section to refer to throughout the semester. 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.
3. This syllabus is subject to change at any time during the semester with changes to be announced in class.
4. An I (incomplete) grade is given only for extenuating circumstances and in accordance with University and Departmental Policies.
5. To comply with FERPA policies, I will communicate via email (email me at Elias.Kougianos@unt.edu) **but I will only respond to UNT email accounts.**
6. Each student should retain graded lecture notes, pop quizzes, homework, tests, software-generated files, and laboratory reports to document errors in recorded grades.
7. Challenges to the course grade must be presented within 60 days of receipt of grade notices mailed by the university. This will ensure that instructor's records are still available to allow a review of the assigned grade. You should first discuss your complaint with the instructor. If you wish to carry it further, contact the Program Coordinator by calling (940) 891-6872. To further pursue your complaint, contact the Department Chair, but **ONLY** after first discussing your concern with the previous two individuals.
8. The Student Perceptions of Teaching (SPOT) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider SPOT to be an important part of your participation in this class.
9. Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. Visit UNT's [Code of Student Conduct](https://deanofstudents.unt.edu/conduct) (<https://deanofstudents.unt.edu/conduct>) to learn more.

AI, Plagiarism and Academic Integrity

The unauthorized use of any person or technology that assists in a student's assignment, project, or paper is considered cheating under the UNT Student Academic Integrity Policy (UNT Policy 6.003). Unless a professor or instructor gives explicit authorization, AI cannot be used to complete assignments, projects, or papers. Doing so will result in a “cheating” violation. **If you have any questions regarding this policy, talk to your instructor.**