Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: ECE
Course and Section #: 2700 Sec. 001
Course Title: Digital Design I
Credits: 3

Course Description

Studies Linear systems, abstract vector spaces, matrices through eigenvalues and eigenvectors, solution of ordinary differential equations, Laplace transforms, first order systems, and complex numbers.

Course Attributes

This course has the following attributes:

☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☐ Open Elective

Other: *Click here to enter text.*

Instructor Information

Instructor Name: Dr. Afsaneh Minaie
Office: CS 425j; Email: minaieaf@uvu.edu

Student Learning Outcomes

- Solve problems using Boolean Algebra
- Utilize techniques for minimizing logic functions
- Design combinational circuits such as decoders, multiplexers, and adders
- Explain hazards in combinational circuits
- Define programmable logic devices (PLAs, CPLD, FPGA)
- Design sequential circuits such as counters and registers

Course Materials and Texts

Textbook: Fundamentals of Logic Design, Roth, Charles Jr., Seventh Edition, ISBN: 13: 978-1-133-62847-7.
zyBooks, ECE 2700: Digital Design I (Spring 2025), Wiley, ISBN 979-8-203-94404-7.

Course Requirements

Course Assignments, Assessments, and Grading Policy
Your performance on the following will determine your course grade:

HW	20%
zyBook Activities	25%
Two Tests	30%
Final Exam	25%
Total	100%

Ten percent will be deducted from the homework grade for each late day Monday through Friday. So, a late assignment must be submitted within ten working days of its due date, after which no credit will be given.

You are responsible for all material in the text, class lectures, zyBook activities, and supplemental reading assignments. Grades will be assigned according to the following schedule:

93% & above	A	73 – 76%	C
90 – 92%	A-	70 – 72%	C-
87 – 89%	B+	67 – 69%	D+
83 – 86 %	B	64 – 66%	D
80 – 82%	B-	60 – 63%	D-
77 – 79%	C+	0 – 59%	E

Tests and Final Exam:

- No make-up exams will be given unless you have a **university approved excuse** and only by previous arrangement with me; otherwise, the student will receive a score of **"ZERO"** on the test.
- You are expected to take the final exam when it is scheduled. Students with a documented need for accommodation must make special arrangements with the instructor.

Required or Recommended Reading Assignments
Chapter 1: Introduction - Number Systems and Conversion
Chapter 2: Boolean Algebra
Chapter 3: Boolean Algebra
Chapter 4: Application of Boolean Algebra
Chapter 5: Karnaugh Maps
Chapter 7: Multi-Level Gate Circuits NAND and NOR Gates
Chapter 8: Combinational Circuits Design and Simulation Using Gates
Chapter 9: Multiplexers, Decoders, and PLD
Chapter 11: Latches and Flip-Flops
Chapter 12: Registers and Counters

General Description of the Subject Matter of Each Lecture or Discussion

ECE 2700 Digital Design I

Spring 2025

This schedule is tentative

Date		Day	Reading Assi	Class #	Topics	Homework (HW)
Jan	7	T	Chapter 1	1	**Chapter 1: Introduction Number Systems and Conversion**	
Jan	9	R	Chapter 1	2	**Chapter 1: Introduction Number Systems and Conversion**	
Jan	14	T	Chapter 1	3	**Chapter 1: Introduction Number Systems and Conversion**	**Chapter 1 HW: 1.1(a), 1.2(a), 1.3, 1.5(a), 1.6(a), 1.7(a, b), 1.9, 1.10 (a), 1.11(a), 1.12 (a), 1.18(a), 1.19(a)**
Jan	16	R	Chapter 2	4	**Chapter 2: Boolean Algebra**	
Jan	21	T	Chapter 2	5	**Chapter 2: Boolean Algebra**	
Jan	23	R	Chapter 2	6	**Chapter 2: Boolean Algebra**	**Chapter 2 HW: 2.1(a), 2.3(a), 2.4(a), 2.5(a), 2.6(b), 2.7(a), 2.8(a), 2.9(a), 2.12(a), 2.13(b), 2.15(a), 2.16(a), 2.22(a)**
Jan	28	T	Chapter 3	7	**Chapter 3: Boolean Algebra**	
Jan	30	R	Chapter 3	8	**Chapter 3: Boolean Algebra**	
Feb	4	T	Chapter 3	9	**Chapter 3: Boolean Algebra**	**Chapter 3 HW: 3.6(a), 3.7(a), 3.8, 3.10(a), 3.12, 3.14(b), 3.15(b), 3.16(a), 3.17(a), 3.18(a), 3.21(a), 3.28 (a)**
Feb	6	R	Chapter 4	10	**Chapter 4: Applications of Boolean Algebra**	
Feb	11	T	Chapter 4	11	**Chapter 4: Applications of Boolean Algebra**	
Feb	13	R	Chapter 4	12	**Chapter 4: Applications of Boolean Algebra**	**Chapter 4 HW: 4.1 (a), 4.4 (a), 4.6(b), 4.9, 4.11(a), 4.13, 4.27, 4.29(a), 4.30, 4.32(a)**
					Test #1 - Capters 1, 2, 3, 4	**The date for the test will be announced in class after finishing Chapter 4.**
Feb	18	T	Chapter 5	13	**Chapter 5: Karnaugh Maps**	
Feb	20	R	Chapter 5	14	**Chapter 5: Karnaugh Maps**	
Feb	25	T	Chapter 5	15	**Chapter 5: Karnaugh Maps**	**Chapter 5 HW: 5.3, 5.4, 5.6 (a), 5.7(b), 5.8(a), 5.10(a), 5.12(a), 5.22(a), 5.43(a), 5.44(a)**
Feb	27	R	Chapter 7	16	**Chapter 7: Muti-Level Gate Circuits**	
Mar	4	T	Chapter 7	17	**Chapter 7: Muti-Level Gate Circuits**	
Mar	6	R	Chapter 7	18	**Chapter 7: Muti-Level Gate Circuits**	**Chapter 7 HW: 7.1, 7.3, 7.4, 7.5, 7.6, 7.7, 7.11, 7.20, 7.29, 7.42, 7.44**
					Spring Break - March 10 - 15	
Mar	18	T	Chapter 8	19	**Chapters 8: Combinational Circuit Design and Simulation Using Gates**	
Mar	20	R	Chapter 8	20	**Chapters 8: Combinational Circuit Design and Simulation Using Gates**	
Mar	25	T	Chapter 8	21	**Chapters 8: Combinational Circuit Design and Simulation Using Gates**	**Chapter 8 HW: 8.1, 8.2, 8.3, 8.4**
Mar	27	R	Chapter 9	22	**Chapter 9: Multiplexers, Decoders, and Programmable Logic Devices**	
Apr	1	T	Chapter 9	23	**Chapter 9: Multiplexers, Decoders, and Programmable Logic Devices**	
Apr	3	R	Chapter 9	24	**Chapter 9: Multiplexers, Decoders, and Programmable Logic Devices**	**Chapter 9 HW: 9.13, 9.14, 9.15, 9.24, 9.25, 9.26 (a), 9.41**
					Test # 2 - Chapters 5, 7,8, 9	**The date for the test will be announced in class after finishing Chapter 9.**
Apr	8	T	Chapter 11	25	**Chapter11: Latches & Flip- Flops**	
Apr	10	R	Chapter 11	26	**Chapter11: Latches & Flip- Flops**	**Chapter 11 HW: 11.11, 11.12, 11.19(a), 11.21, 11.22(a)**
Apr	15	T	Chapter 12	27	**Chapter 12: Registers and Counters**	
Apr	17	R	Chapter 12	28	**Chapter 12: Registers and Counters**	**Chapter 12 HW: 12.7, 12.8**
Apr	22	T			**Review for Final Exam**	
Apr	29	T		FE	**Final Exam**	**Tuesday, April 29th (1:00 p.m. – 2:50 p.m.)**

Required Course Syllabus Statements

Generative AI

AI programs are not a replacement for your human creativity, originality, and critical thinking. Writing, thinking, and researching are crafts that you must develop over time to develop your own individual voice. At the same time, you should learn how to use AI and in what instances AI can be helpful to you.

The use of generative AI tools (e.g. ChatGPT, Google Bard, etc.) is permitted in this course for the following activities:

- Brainstorming and refining your ideas;
- Fine tuning your research questions;
- Finding information on your topic;
- Drafting an outline to organize your thoughts; and
- Checking grammar and style.

The use of generative AI tools is not permitted in this course for the following activities:

- Impersonating you in classroom contexts, such as by using the tool to compose discussion board prompts/responses assigned to you or content that you put into a Teams/Canvas chat.
- Completing group work that your group has assigned to you, unless it is mutually agreed upon that you may utilize the tool.
- Writing a draft of a writing assignment.
- Writing entire sentences, paragraphs, or papers to complete class assignments.

You are responsible for the information you submit based on an AI query (for instance, that it does not violate intellectual property laws, or contain misinformation or unethical content). Your use of AI tools must be properly documented and cited to stay within university policies on academic honesty.
Any student work submitted using AI tools should clearly indicate what work is the student's work and what part is generated by the AI. In such cases, no more than 25% of the student work should be generated by AI. If any part of this is confusing or uncertain, please reach out to me for a conversation before submitting your work.

Using Remote Testing Software

☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities

Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity

At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX

Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.