

ECE 2372: Modern Digital System Design

Credit / Contact hours: 3 / 3

Course coordinator: Dr. Tooraj Nikoubin

Textbook(s) and/or other required material: M.M. Mano and C.R. Kime, "Logic and Computer Design Fundamentals" 5th Edition, Pearson -Prentice Hall

Catalog description: An introduction to combinational and sequential digital systems

Pre-requisite(s): 2.0 TTU GPA; C or better in MATH 1451 (may be taken concurrently)

Co-requisites (if any): None

Designation: Required

Course learning outcomes: Upon completion of this course, students should be able to do the following:

- Analyze and design of combinational digital logic circuits.
- Analyze and design of sequential digital logic circuits.
- Use hardware description language and logic simulation tools.
- Use digital electronic components to prototype simple logic circuits

ABET Student Outcomes addressed in course: a, c, e, j and k.

Topics covered

Topics	Lectures
• Introduction, Number Systems and Conversion	1L
• Logic Gates and Boolean Algebra	1L
• Applications of Boolean Algebra, Minterm and Maxterm Expansions	2L
• Multi- Level Gate Circuits , NAND and NOR Gates	1L
• Karnaugh Maps and Quine-McClusky Method for simplification	1L
• Combinational Circuit Design,	1L
• Multiplexers, Decoders, ROM and Programmable logic Devices	2L
• Add and Sub, Adders, Subtractors and Comparators	1L
• Coding	1L
• Hardware description language for combinational circuits	1L
• Latch and Flip-Flops	2L
• Registers and Buffers	1L
• Counters and Counter circuit design	2L
• Analysis of clocked Sequential Circuits	2L
• Sequential Circuit Design	2L
• State machine design	2L
• Arithmetic Circuits	1L
• Hardware description language for sequential circuits	1L
• Review, Midterm and Final Exam	3L
	Total 28L
	L=75min