

CSCE 211 - Digital Logic Design

Credit Hours: 3 hours

Contact Hours: 3 lecture hours

Course coordinator: Dr. Chin-Tser Huang

Required Textbooks:

- Alan B. Marcovitz, *Introduction to Logic Design, Third Edition*, McGraw Hill, 2010.
- Maik Schmidt, *Arduino: A Quick-Start Guide*, Pragmatic Programmers, 2011
 - Arduino circuit kits will be provided at no cost.

Bulletin Description: Number systems, Boolean algebra, logic design, sequential machines.

Prerequisites: MATH 141.

Required Course in CE and CS programs

Learning Outcomes: Students will be able to:

1. Represent numbers and perform arithmetic in bases 2, 8, 10, and 16.
2. Encode symbols and numbers in binary codes.
3. Add and subtract using 2's complement code.
4. Evaluate and simplify logical functions using Boolean algebra.
5. Represent logical functions in Canonical form.
6. Analyze and design combinatorial circuits.
7. Simplify combinatorial circuits using Karnaugh maps.
8. Implement functions with NAND-NAND and NOR-NOR logic.
9. Analyze and design modular combinatorial logic circuits containing decoders, multiplexers, demultiplexers, 7-segments display decoders and adders.
10. Use the concepts of state and state transition for analysis and design of sequential circuits.
11. Use the functionality of flip-flops for analysis and design of sequential circuits.
12. Introduce computational problem-solving technique.

Student (Program) Outcomes addressed by course (Detailed mappings of these course outcomes to the Student Outcomes of the programs are in the detailed syllabus.)

Student Program Outcomes	SOs supported	SOs Moderately supported
Computer Engineering	c, k	a, b, d, e
Computer Information Systems		
Computer Science	c, i, CS-k	a, b, CS-j

Topics covered:

1. Introduction to Boolean logic
2. Combinational Systems
3. Karnaugh Maps
4. Designing Combinational Systems with Medium Scale Integrated Circuits
5. Analysis of Sequential Systems
6. Design of Sequential Systems