CSCE 211 - Digital Logic Design

- **Credit Hours:** 3 hours
- **Contact Hours:** 3 lecture hours
- **Instructor:** Dr. Chin-Tser Huang, Dr. Jeremy Lewis
- **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 to the student.
- **Bulletin Description:** Number systems, Boolean algebra, logic design, sequential machines.
- **Prerequisite:** MATH 141.
- **Required Course** in CE and CS
- **Course 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 Outcomes addressed by course**

Program	Student Outcomes Addressed
Computer Engineering	1, 2, 6
Computer Information Systems	N/A
Computer Science	1, 2

- **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