

1. Course number and name

EE 214: Design of Logic Circuits

2. Credits and contact hours

4 (3 lecture hours and 3 lab hours per week)

3. Instructor's or course coordinator's name

Clint Cole

4. Text book, title, author, and year

John F. Wakerly, 2018. *Design Principles and Practices* (5th ed.) (optional)

Project Materials: (design projects, exercises, reading) <www.realdigital.org>

Other supplemental materials

Blackboard circuit board (*Real Digital*); Vivado Webpack (*Xilinx*); Instructor notes and slides for some topics

5. Specific course information

a. *Catalog description:* Design and application of combinational logic circuits with exposure to modern methods and design tools; introduction to sequential logic circuits.

b. *Prerequisites or co-requisites:* Prior programming class (C, Java, or equivalent) recommended.

6. Specific goals for the course

At the end of this course, students must be able to:

- Represent logic circuits requirements in an engineering formalism. (1)
- Construct behavioral and structural logic circuit implementations using Verilog. (1,2,6)
- Know how to analyze a logic system to find a minimum implementation. (2,6)
- Know the structure and function of common logic circuits (multiplexors, shifters, adders, registers, counters, etc.). (1,2,6)
- Be able to design a combinational or sequential logic circuit to meet a given requirement using structural and/or behavioral methods. (1,2,6)
- Be able to use modern design tools to capture, simulate, and synthesize circuit designs. (1,2,6)
- Effectively communicate technical design details to instructional staff. (3)

7. Brief list of topics to be covered

- Basic definitions and electronic circuits,
- Field-effect transistors and CMOS circuits,
- Logic circuits and logic gates and their representations,
- Logic minimization theory and techniques,
- Use of modern design technologies and CAD environments,
- Design and function of common combinational digital circuits,
- Verilog syntax and its use in modelling circuits,
- Design of common arithmetic circuits,
- Design of sequential circuits.