ECE 4382: Digital IC Analysis and Design

Credit / Contact hours: 3 / 3

Course coordinator:

Textbook(s) and/or other required material:


Catalog description: Design of VLSI digital integrated circuits including basic device theory and processing technologies.

Pre-requisite: ECE 3312 and ECE 3362

Designation: Selected Elective (CMPE), Elective (EE)

Course learning outcomes: Upon completion of this course students should be able to

1. Analyze and design digital integrated circuits and subsystems.
2. Apply computer aided design and simulation tools to digital IC’s and subsystems.
3. Develop transistor level and layout level representations of digital IC’s and subsystems.

Student outcomes addressed: a, c, e, and k.

Topics covered:

Introduction - 2 hours
Combinational Logic Review - 3 hours
Sequential Systems Review - 3 hours
Introduction to Verilog - 2 hours
Behavioral Models - 3 hours
Basics of Verilog language - 3 hours
Logic Synthesis - 3 hours
VLSI Fabrication - 3 hours
CMOS Logic - 3 hours
Transistors and Layout - 3 hours
Logic Gates - 2 hours
Logic Networks - 3 hours
Floorplanning - 2 hours
Transistor level Simulation - 3 hours
Tests and reviews - 4 hours