

Core Engineering Program: ABET Course Outcomes

Course: EN160 – Design and Implementation of Very Large-Scale Integrated Systems

Instructor: Professor Reda

Revision Date: Spring 2008

Course Description: This course focuses on the design of complex digital systems. Topics include CMOS devices and manufacturing technology, logic gates and their layout, propagation delay, reliability issues, and power dissipation. The goal of the course is to learn how to design and implement CMOS digital circuits and optimize them with respect to different constraints such as area, speed, power dissipation, and reliability. Using a complete VLSI design toolset, students will be required to complete a major course project that implements a particular microarchitecture from the behavior-level down to layout.

Prerequisite: EN163, or instructor permission

Outcomes: Students completing EN160 shall:

1. Have the ability to synthesize static and dynamic logic cells based on knowledge of MOS device physics, modeling, and circuit topologies.
Addresses ABET outcomes (a), (b), (c), (e), (k)
Assessment: Design project, student survey
2. Be capable of designing and implementing combinational and sequential CMOS digital circuits and optimize them with respect to different constraints, such as area, delay, power, or reliability.
Addresses ABET outcomes (a), (b), (c), (e), (k)
Assessment: Design project, student survey
3. Be capable of implementing a complete design verification process using computer-automated tools for layout, extraction, simulation, and timing analysis.
Addresses ABET outcomes (a), (b), (c), (e), (k)
Assessment: Design project, student survey
4. Design and verify a prototype silicon integrated circuit suitable for fabrication using the AMI 0.8- μm CMOS process.
Addresses ABET outcomes (a), (b), (c), (e), (k)
Assessment: Design project, student survey