THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Advanced Digital Design

ECE 3561

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)

Course Components:
Lecture

Course Description:
Design and analysis of sequential circuits; digital circuit design using building blocks, programmable logic devices; design of basic computer components such as arithmetic logic units.

Prerequisites and Co-requisites:
Prereq: 2000, 2060, 2061, 2010, 2000.02, 290, 294 (Autumn 2010) or 206 and 261. Prereq or concur: 3020 (323), and enrollment in ECE, EngPhys, or CSE majors; or prereq or concur 2010 and permission of department.

Course Goals / Objectives:
- Learn digital design principles and practice and learn to design using building blocks such as counters, shift registers, and adders and programmable logic devices such as FPGAs and CPLD
- Learn methods to design clocked sequential circuits using state diagrams and tables, state reduction and state assignment methods
- Learn to perform timing analysis at each step of the design
- VHDL is introduced
- Design and simulate digital circuits using a state-of-the-art CAD package. Both schematic and VHDL-based design is supported

Course Topics:

- Clocked synchronous state-machine analysis and timing
- Clocked synchronous state-machine design
- Design with counters, shift registers, multiplexers, comparators, decoders, and adders
- Design with asynchronous inputs and for glitch-free outputs
- VHDL for combinational logic and state machine design
- Logic implementation with PLDs, FPGAs, and ROMs

Designation:

Required
Elective