

**CSCE 611: Advanced Digital Design**

**Credit Hours:** 3 hours

**Contact Hours:** 3 lecture hours

**Instructor:** Dr. Jason Bakos

**Required Textbooks:** None.

**Bulletin Description:** Design techniques for logic systems; emphasis on higher-level CAD tools such as hardware description languages and functional modeling

**Prerequisites:** CSCE 212

**Required Course** in CE, SE in CIS and CS programs

**Learning Outcomes:** Students will be able to:

1. *HDL design:* Design large-scale digital systems using VHDL
2. *Simulation and verification:* Perform behavioral verification using test benches and simulation
3. *Microarchitecture design:* Design a pipelined microprocessor that implements the MIPS instruction set
4. *Interconnect design:* Design a system bus architecture with CPU, memory, and I/O interfaces
5. *Logic synthesis:* Synthesize, place-and-route, and implement a computer system on a programmable hardware platform

**Student (Program) Outcomes addressed by course** (Detailed mappings of these course outcomes to the Student Outcomes of the programs are in the detailed syllabus and the Assessment plan.)

Student Program Outcomes	SOs supported	SOs Moderately supported
Computer Engineering	a, c, e, k	h
Computer Information Systems		
Computer Science		

**Topics covered and approximate weight:**

1. VHDL digital design flow
2. Design methodologies and techniques
3. Microarchitecture design
4. Test bench design
5. Memory models
6. Bus and interface design