

## CSCE 313 - Embedded Systems

**Credit Hours: 3 hours**

**Contact Hours:** 3 lecture hours

**Instructor:** Dr. Jason Bakos

**Required Textbooks:** Ronald Sass and Andrew G. Schmidt, *Embedded Systems Design with Platform FPGAs: Principles and Practices*, Elsevier, 2010.

**Bulletin Description:** Fundamentals of embedded systems: hardware components, software components, hardware/software interface design, and hardware/software co-design.

**Prerequisites:** CSCE 211, 212

### Required Course in CE program

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

1. Perform hardware/software co-design for a programmable embedded system;
2. Write software that directly interfaces with I/O peripherals such as LEDs, LCD panels, buttons, monitors, and remote consoles;
3. Write software that performs real-time processing of audio and video data;
4. Use high-level synthesis tools to develop coprocessor architectures in an embedded environment.

**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	c, e, h, k	b
Computer Information Systems		
Computer Science	a, b, c, d, i, CS-k	

### Topics covered and approximate weight:

1. Design constraints for embedded systems (1 week);
2. Platform FPGA design methodology for programmable system-on-a-chip (2 weeks);
3. Image processing (3 weeks);
4. Audio processing (3 weeks);
5. Video processing (3 weeks);
6. Embedded application acceleration using special-purpose logic (2 weeks).