

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
- **Course 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 video data;
 4. Use high-level synthesis tools to develop coprocessor architectures in an embedded environment.
- **Student Outcomes addressed by course**

Program	Student Outcomes Addressed
Computer Engineering	1, 2, 6
Computer Information Systems	N/A
Computer Science	N/A

Topics covered

1. Design constraints for embedded systems (3 hours)
2. Platform FPGA design methodology for programmable system-on-a-chip (6 hours)
3. Image processing (9 hours)
4. Audio processing (9 hours)
5. Video processing (9 hours)
6. Embedded application acceleration using special-purpose logic (6 hours)