CSCE 313 - Embedded Systems
- **Credit Hours:** 3 hours
- **Contact Hours:** 3 lecture hours
- **Instructor:** Drs. Jason Bakos, Rasha Karakchi
- **Recommended Textbooks:** Jason Bakos, *Embedded Systems: ARM Programming and Optimization*, Morgan Kaufmann, 1st edition (2015)
- **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 (8 hours)
    3. Image processing (9 hours)
    4. Video processing (9 hours)
    5. Embedded application acceleration using special-purpose logic (6 hours)
    6. Reliability and safety in embedded systems (3 hours)