CSCE 491- Capstone Computer Engineering Project

- **Credit Hours:** 3 hours
- **Contact Hours:** 75 lecture minutes and 75 lab minutes
- **Instructor:** Dr. Jason D. Bakos
- **Required Textbooks:** None
- **Bulletin Description:** Advanced computer systems engineering. Team projects. Written reports and oral presentations in a technical setting.
- **Prerequisite:** CSCE 240, 313, 611
- **Required Course** in CE
- **Course Outcomes:** Students will be able to:
  1. Identify, formulate, and solve complex computer engineering problems.
  2. Apply the techniques, skills, and tools of modern computer engineering practice to design a system consisting of both hardware and software components.
  3. Design a system that meets specified needs with consideration of multiple constraints.
  4. Communicate effectively with a range of audiences.
  5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

- **Student Outcomes addressed by course**

Program	Student Outcomes Addressed
Computer Engineering	1, 2, 3, 5, 7

- **Topics Covered**
  1. Embedded general purpose communication protocols (SPI, I2C, UART, etc.) [2 Weeks]
  2. Development and debugging of "bare metal" software (software that executes without an operating system) [2 Weeks]
  3. Hardware/software interfacing and co-design, including the use of sensors and actuators and human interface device such as buttons, switches, LEDs, displays, etc. [2 weeks]
  4. Developing a hardware peripheral and interfacing it to software [2 weeks]
  5. Testing electronic systems using laboratory bench equipment, including an oscilloscope, logic analyzer, digital multimeter, and power supply [2 weeks]
  6. Control theory [2 Weeks]
  7. Real-time systems [2 weeks]
  8. Queueing theory [1 week]