CPE 4010: Sensors, Actuators and Integration

4 Credit Hours

Prerequisite: (CPE 3000 or EE 3501), and EE 3401, and PHYS 2212, and Engineering Standing

This course provides an introduction to the theory and applications of modern sensors and actuators. The mathematical and physical principles that underlie the operation and uses of various types of sensors and actuators as well as the acquisition, processing, and driving of signals associated with these devices is explored. Sensory- and actuator-based devices interfaced with embedded systems are used to augment the theoretical concepts taught.

CPE 4020: Device Networks

4 Credit Hours

Prerequisite: CPE 3000 and Engineering Standing

This course provides an introduction to basic networking theory, protocols and technologies and their use in the internetworking of embedded systems. Various networking interface technologies (wireless and wireline) are studied from a conceptual, hardware, and programmatic perspective; the learning experience is augmented via the design and implementation of practical applications using modern Single Board Computers (SBC) and peripheral devices. The concept of the Internet of Things (IoT) is interwoven throughout the course in order to provide the student with a clear grasp of the evolution of such networked devices and how they can be controlled locally, remotely, and within the "cloud."

CPE 4040: Data Collection and Analysis

3 Credit Hours

Prerequisite: CPE 3030, STAT 2332, and Engineering Standing

This course will provide an introductory look at concept and techniques in the data collection and analysis. After covering the introduction the abstract data types and use of standard data structures, the techniques used to implement numerical algorithms, visualize and process the data, evaluate and validate prediction models and various implementation platforms (computer architectures) for efficient data analysis will be covered. By the end of the course participants should have acquired the skills to plan and execute data collection and analysis campaigns in technical application scenarios.