CPE 4202: Embedded Digital Control Systems

3 Credit Hours

Prerequisite: CPE 3000 and EE 4201

This course introduces the theoretical foundations and practical implementations of digital control systems. Difference equations and the Z-transform, and the time response and frequency response of discrete-time systems, are covered. Modeling of digital control systems and the components that comprise them, including analog-to-digital converters, digital to analog converters, zero-order hold, and computation/time delays are explored. Stability analysis of closed-loop systems, digital controller design based on root-locus and frequency response approaches will be introduced. Hardware applications of the analysis and design principles will be tested on embedded systems.

Notes: This course may be cross-leveled with CPE 6202.

CPE 4400: Directed Study in Computer Engineering

1-4 Credit Hours

This course covers special topics and seminars of an advanced nature, external to regular course offerings that allow a student to work individually with an instructor. A Directed Study may include original research projects and/or practical experiences.

CPE 4490: Special Topics in Computer Engineering

1-4 Credit Hours

Prerequisite: Varies by Topic

This course covers advanced topics of special interest to faculty and students that are not in the regular course offerings. Offered on a demand basis. This course may be taken more than once.

CPE 4750: Introduction to Internet of Things (IoT)

3 Credit Hours

Prerequisite: CPE 3000 or EE 3501

This course provides an overview of the system architecture, covering fundamental knowledge for each core technology stack: the device layer, the communication network layer, and the application layer. Students will gain exposure to various smart IoT applications and explore the design trade-off in power consumption, real-time constraint, and size limitation. Students will learn hands-on labs and projects, the basics of data analytics by using off-the-shelf IoT HW and commercial IoT platform to solve real-world problems.