CPE 1001L: Introduction to Computer Engineering Lab

1 Credit Hours

Prerequisite: ENGR 1000

Students will learn a variety of concepts via hands-on exercises and group activities. We will introduce Python as a programming language, along with the Raspberry Pi hardware platform, to create an integrated hardware/programming environment where students can learn Linux, programming, hardware sensors/actuators, the IoT, machine learning, and IP/TCP. There will also be group activities pertaining to interpersonal skills development. At the end of the semester, there will be a project.

CPE 2200: Hardware Programming

3 Credit Hours

Prerequisite: ENGR 1000 and EE 2501

This course introduces fundamental concepts of computing by studying instruction flow in a processor architecture. We will study how Assembly and C languages are to drive the architecture and explore fundamental hardware operations. Topics include computer architecture, problem-solving, and algorithm development. Programming assignments focus on techniques of good programming style including proper documentation. The student is taught to efficiently design, code, and debug problem solutions, relevant to embedded software design.

CPE 3000: Computer Organization and Interfacing

4 Credit Hours

Prerequisite: MATH 1190, CPE 2200, CSE 1321, CSE 1321L, and Engineering Standing

This course will introduce the students to the fundamental concepts of computer organization including basic register storage, ALUs, and state machines. In addition, we will study how assembly language is used to drive this architecture and explore fundamental hardware operations such as shifting, bit manipulation, and bit testing. Interfacing our architecture to external systems will also be discussed.

CPE 3020: VHDL Design with FPGAs

4 Credit Hours

Prerequisite: EE 2501 and Engineering Standing

This course will explore the design and development of synchronous and asynchronous machines using VHDL. VHDL is an industry standard design language used to create complex embedded digital systems in programmable devices such