Certificate in Embedded Systems (Computer Science and Engineering)

About This Program

The Undergraduate Certificate in Embedded Systems offered through the Computer Science and Engineering Department and will educate undergraduate students in the knowledge and skills required to design and test embedded systems, using microcontrollers, system-on-chip, and FPGA devices. Topics include multi-threaded programming on bare-metal, custom real-time operating systems, and embedded Linux systems; implementation of IP stacks for computer networking; network and wireless protocol development for Internet of Things devices; design of real-time operating systems; implementation of RISC processors in FPGA devices; design of advanced digital logic systems; analysis and design of microprocessor systems; and control of systems with electromechanical actuators and sensors. The Certificate in Embedded Systems (Computer Science and Engineering) will be awarded concurrently with an undergraduate degree.

Competencies

1. Upon completion, students will have the ability to understand the fundamental theory and design of embedded systems and a variety of commonly used hardware such as microcontrollers, microprocessors, and field-programmable gate arrays (FPGAs).
2. Upon completion, students will have the ability to choose an appropriate embedded platform, such as bare metal or embedded-Linux, and using task-appropriate programming or hardware description languages, implement a variety of practical embedded systems concepts. Examples of such concepts include memory interfaces, asynchronous and synchronous serial communications, timer-based peripherals, device drivers, PID control, and analog to digital (A/D) and digital to analog (D/A) converters.
3. Upon completion, students will have the ability to apply this knowledge to subject areas such as Internet of Things (IoT) and networking, real-time systems, low power systems, electromechanical systems, wireless communications, system on chip (SOC) design, and RISC processor design.

Admissions Criteria

The certificate is open to all degree-seeking students. Student who are not a part of an engineering professional program should contact a CSE advisor for permission.

Curriculum

Foundations

CSE 3442	EMBEDDED SYSTEMS I	4
CSE 4342	EMBEDDED SYSTEMS II	3
Specialization		
Select 3 from the following:		9
CSE 3341	DIGITAL LOGIC DESIGN II	
CSE 4352	IOT AND NETWORKING	
CSE 4354	REAL-TIME OPERATING SYSTEMS	
CSE 4355	ELECTROMECHANICAL SYSTEMS AND SENSORS	
CSE 4356	SYSTEM ON CHIP (SOC) DESIGN	
CSE 4372	RISC PROCESSOR DESIGN	
CSE 4377	WIRELESS COMMUNICATION SYSTEMS	
Total Hours		**16**

Any course substitution has to be approved beforehand by the certificate coordinator.

Program Completion

A combined GPA of 3.0 or better must be earned on all courses used to satisfy the certificate requirements.

Advising Resources

First time in college students meet with engineering advisors in the UAEC (UAECengineering@uta.edu). Transfer students are advised prior to New Maverick Orientation by the department. Students, please read all student emails carefully and consult the department advising webpage for additional contact information and answers to common questions.

Location:

ERB 6th Floor: ERB 643, ERB 644, ERB 645, ERB 646, ERB 622A

Email:

cseugadvising@uta.edu

Phone:

817-272-3785

Web:

Find our contact information, walk-in advising schedule, and virtual appointment links here (https://www.uta.edu/academics/schools-colleges/engineering/academics/departments/cse/students/undergraduate-advising/)