1

ARDUINO - DESIGN AND IMPLEMENTATION FUNDAMENTALS - MICRO-CREDENTIAL

The Arduino micro-credential offers students the opportunity to demonstrate their proficiency in using Arduino microcontrollers as part of larger, electro-mechanical systems. It highlights students' expertise in the programming of an Arduino microcontroller and their ability to optimize the implementation of an Arduino into robust, robotic systems.

The Arduino Micro-credential serves as an endorsement that the engineer is able to combine and apply knowledge of Arduino, micro-controller, circuits, and electro-mechanical systems in a meaningful way. Successful completion of this micro-credential also reflects the engineer's ability to explore innovative design paths and justify their design decisions to their peers. It represents a level of intuition and intention behind the engineer's design work that is otherwise unmeasured. Experienced software and embedded systems design engineers know that the syntax and theory behind a design are only part of the design process; both the implementation of best-practices (such as the proper documentation of a CAD model, or the use of error handling in a piece of code) and design intuition are the indicators of an engineer who has cultivated their skills with experience and intention. These are the traits of a valuable teammate in any professional engineering project and traits that students must demonstrate to complete the Arduino Micro-credential.

Eligibility

- CU Boulder Students (including nondegree/ACCESS)
- CU Boulder Students (Degree Seeking Only)

Delivery Mode

In-Person

Credit Status

Noncredit

Academic Level

- Graduate
- Undergraduate

Time to Completion

Months

Fee

Yes

Requirements

Completion of the Arduino micro-credentialrequires the following:

- Complete all Arduino and Electronics-titled skillbuilding workshops hosted by the ITLP (totaling 6 workshops: Arduino Intro, Motion, Communication, Miniaturization, and Electronics Intro, Soldering)
- 2. Complete the "Arduino Fundamentals" certification exam hosted by Arduino LLC

- Complete a short-answer "Arduino-based Circuits and Systems" practicum
- 4. Design, build, test, and present a final, Arduino-based project.

Criteria

Completion of the Arduino micro-credentialis dependent on the learner's ability to complete the following learning objectives:

- Demonstrate an understanding of the lessons taught through the ITLP workshops by writing synopses of each workshop
- Earn a passing score on the "Arduino Fundamentals" certification exam
- Justify the answers of the short-answer practicum to a microcredential advisor
- Design and build a unique, Arduino-controlled electro-mechanical system with at least one output and/or one input, of a complexity deemed appropriate by a micro-credential advisor
 - Defend the design when reviewed by a panel of their advisors, justifying design choices through test results
 - Document the design in a way that is easily understood and replicated by an engineer of a comparable aptitude

Skills

- Microcontrollers
- Arduino
- Circuits
- Embedded Systems
- Robotics
- Elector-Mechanical Systems
- Arduino Programming Language
- Coding
- Public Speaking
- Design Documentation
- Soldering
- PCB Design
- Electronics