

Institute of Coding Skills Bootcamp

Aber Code: XC12110

Title: Microcredentials: Programming with Microcontrollers

Start date: 30/10/2023

Location: Online

Cost: Free

Contact Hours: 2x 2 hours per week,

Course length: 5 weeks

Signup Link: [https://www.aber.ac.uk/en/lifelong-learning/courses/course/details/SL104\\_XC12110/](https://www.aber.ac.uk/en/lifelong-learning/courses/course/details/SL104_XC12110/)

#### Synopsis:

This standalone, micro-credential module aims to provide a basic grounding in programming with microcontrollers. After exploring their fundamentals you'll move on to writing your first programs for a microcontroller. Delivery will also be online through lectures, recordings, and practical workshops.

#### Notes:

This module is aimed at learners who have previous experience in programming and would like to further apply their knowledge to program microcontrollers. The module is designed to be a continuation in line with our 'Introduction to Programming' microcredential course.

#### Assessment:

Learners will be assessed in three components:

1. A weekly programming worksheet to be completed by the student,
2. Each week a short multiple choice quiz will help explore that week's work,
3. Finally, a mini-project to solve a real-world solution, exploring the concepts covered in the module.

#### Aims:

This module will introduce students to microcontrollers in general and, specifically, programming one using the C++ language. The module will firstly revise the use of variables, conditionals and loops to build a program. Then we will move on to the concept of programming using an IDE and online emulators. Finally, it will present a number of problems for you to solve with your own microcontroller or an emulator.

The course will be presented in a number of blocks - each will have a worksheet with linked mini-videos plus a live workshop - the latter will be recorded so you can study the course at times that suit you.

#### Learning Outcomes:

On successful completion of this module students should be able to:

Explain and use the basic language elements; Language structure, conventions, variables, constants, data types, operators, expressions, statements, blocks.

Apply abstraction to a design problem, resulting in code that uses functions for separation and reuse of functionality.

Design and implement programs to solve microcontroller problems as presented through the module.

Use third party code and libraries as part of their software solution, and to understand the relevance of software licences and IPR attribution.

Understand and explain the definition of a microcontroller.