

# Institute of Coding Skills Bootcamp

## Computational Thinking

**Location:** Hybrid - Swansea University and online | **Professional Learner Credits:** 10 | **Cost:** Free

**Contact Hours:** 2 hours of tutorials per week, 10 weeks

### Synopsis:

Computational thinking refers to a collection of problem-solving techniques which software developers use to understand problems, break them down, and express their solutions in a step-by-step manner suited to programming on a computer. Whilst crucial for computer scientists and engineers, these problem-solving techniques are general: computational thinking is a fundamental skill, and its techniques are useful for general everyday problem solving. This module will explore the tools and techniques for reasoning about problems in a computational thinking way, using them to solve a wide variety of riddles, puzzles, and more practical problems.

### Notes:

This module is aimed at professional learners who are looking to develop their computational thinking and problem solving skills.

### Assessment:

Learners will be assessed on their understanding of the content through weekly quizzes and a 2-hour exam at the end of the 10 weeks.

### Aim:

This module introduces learners to logical and reasoning tools and techniques for understanding and modelling computing systems and processes.

### Learning Outcomes:

Learners will become familiar with the fundamental mathematical techniques for modelling hardware and software systems and will develop skills in scientific modelling such as abstraction, the precise formulation of informal notions, rigorous reasoning and analysis.

### Syllabus:

Introduction to computational thinking; Propositional logic; Sets; Predicate logic;  
Modelling processes; Distinguishing between processes