

# CS118-15 Programming for Computer Scientists

**21/22**

**Department**

Computer Science

**Level**

Undergraduate Level 1

**Module leader**

James Archbold

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

Multiple

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

This module is a first course in computer programming.

### Module aims

The principal aim of this module is to introduce students to problem solving and structured and object oriented programming.

### Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Fundamentals of programming

Introduction to programming: Programming paradigms; From Specification through Algorithms to Implementation; Program compilation and testing.

Building Elements: Preconditions and postconditions; Basic data types; Variables, identifiers and

scope.

Control structures: Conditionals; Case statements and loops; Correctness issues when programming with loops.

Methods: Comparison between iteration and recursion.

Object oriented programming

Programming with objects and classes: Complex data types; Parameter passing by reference and by value; Encapsulation.

Arrays and strings

Class inheritance: Dynamic binding; Multiple inheritance; Interfaces and abstract classes.

Design, construction and testing

Program specifications

Error handling

Methods of testing

## **Learning outcomes**

By the end of the module, students should be able to:

- Students should be able to understand the programming process, from the definition of the problem and the design of a solution at an abstract level, to the coding itself with an integrated approach to testing for correctness.
- Student should be able to develop programs in a high-level programming language using the imperative paradigm.
- Students should be able to structure complex software using principles of encapsulation and abstraction in the object-oriented programming abstractions.
- Students should be able to apply informal reasoning techniques to justify the correctness of methods and programs, and justify desired properties such as termination.
- Students should be able to use different strategies for testing programs and managing run-time errors using exception handling.

## **Indicative reading list**

Please see Talis Aspire link for most up to date list.

[View reading list on Talis Aspire](#)

## **Subject specific skills**

Experience with the Java programming language

Understanding of Data Types

Iterative Statements

Conditional Statements

Imperative Programming

Object Oriented Programming

Inheritance

Error Handling

Passing by value vs passing by reference.

Learning to thinking programatically and algorithmically and how to take a specification and turn it into a plan for a program.

## Transferable skills

Coding

Problem solving

Communication skills (verbal)

Critical thinking

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## Study

### Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Practical classes	10 sessions of 1 hour (7%)
Private study	120 hours (80%)
Total	150 hours

### Private study description

A significant proportion of independent study should be spent with the coursework assignments, and also completing the problems sheets. The rest should be revision of the material and practising the concepts discussed.

## Costs

No further costs have been identified for this module.

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## Assessment

You do not need to pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

### Assessment group D3

	Weighting	Study time	Eligible for self-certification
Programming assignment 1	20%		Yes (extension)
Programming assignment 2	20%		Yes (extension)

	<b>Weighting</b>	<b>Study time</b>	<b>Eligible for self-certification</b>
In-person Examination Exam	60%		No

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- Answerbook Pink (12 page)

## **Assessment group R1**

	<b>Weighting</b>	<b>Study time</b>	<b>Eligible for self-certification</b>
In-person Examination - Resit Resit Exam	100%		No

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- Answerbook Pink (12 page)

## **Feedback on assessment**

Written feedback via Tabula.

[Past exam papers for CS118](#)

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## **Availability**

### **Post-requisite modules**

If you pass this module, you can take:

- CS126-15 Design of Information Structures

## **Courses**

This module is Core for:

- Year 1 of UCSA-G500 Undergraduate Computer Science
- UCSA-G503 Undergraduate Computer Science MEng
  - Year 1 of G500 Computer Science
  - Year 1 of G503 Computer Science MEng
- Year 1 of UCSA-I1N1 Undergraduate Computer Science with Business Studies
- Year 1 of UCSA-G406 Undergraduate Computer Systems Engineering
- Year 1 of UCSA-G408 Undergraduate Computer Systems Engineering
- Year 1 of USTA-G302 Undergraduate Data Science

- Year 1 of USTA-G304 Undergraduate Data Science (MSci)
- Year 1 of UCSA-G4G1 Undergraduate Discrete Mathematics
- Year 1 of UCSA-G4G3 Undergraduate Discrete Mathematics