MODULE SPECIFICATION

Part 1: Information			
Module Title	Foundations of Computing		
Module Code	UFCFFS-30-1	Level	Level 4
For implementation from	2020-21		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Computer Science and Creative Technologies
Department	FET Dept of Computer Sci & Creative Tech		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: This module introduces the basic programming concepts, techniques, and fundamental problem solving and software development principles.

Educational Aims: This module aims to equip students with the fundamental ideas, logic and mathematical concepts upon which computer science is built.

Outline Syllabus: Mathematical Structures: Numbers. Sets. Functions. Relations Graphs. Matrices. Application of mathematical structure to computing. Enumerating (counting) these structures

Logic: Propositional logic. Truth tables for basic logic operators. Inference methods. Design of digital circuits

Computation models: Finite Machines; Pushdown Automata; Turing Machines. How these abstract machines work. What limitations they have. How to apply them to real world applications.

Formal Languages: words, sentences, languages, grammars, productions. Links to computing models. How to formally define languages. How a compiler detects syntax errors.

Algorithms: Classes of algorithms, search algorithms and sorting algorithms. Time and space complexity of algorithms. NP-complete problems.

Recursion: Inductive definitions and recursive programs.

Finding and using information resources.

Teaching and Learning Methods: Scheduled learning This module will be delivered by a series of lectures accompanied by tutorials. The tutorials will use the course handouts as the basis of discussions of issues presented in the lectures. Students are also expected to begin to identify their own information sources and are supported in this by the UWE library workbook.

Independent learning
Students are expected to work outside scheduled classes on practice, assignment work and directed and semi-directed reading.

Part 3: Assessment

The assessment strategy for this module is designed to scaffold the students' confidence and to introduce them to UWE assessment processes. The first coursework assessment is an online test. The work is automatically marked and therefore gives the students instant feedback. After this introduction to assessment students will complete a library work book and a second coursework portfolio of problem solving task. Both of these assessment will be supported in the labs and tutorials.

The examination takes place at the end of academic year (worth 50%).

The three coursework elements therefore are:
a library workbook which helps the student to be confident in some of the key skills that they need to be successful in their studies
e-assessment – for mathematical questions with a short and unique answer. This short answer format is designed to give students the confidence to answer questions for which they will get very rapid feedback.
Written-assessment – for other types tasks which cannot be marked
automatically and require a certain amount of information resource identification.

The written assessment element will be a portfolio of tasks which the students will complete throughout the year. This strategy helps students to consolidate the taught content immediately after lectures.

This assessment strategy is also used if a student needs to resit the module.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination (Online) - Component A	✓	50 %	2-hour examination
Written Assignment - Component B		25 %	This assessment is taken online (i.e. e-assessment). Students need to complete a list of tasks which require a short and unique answer.
Written Assignment - Component B		20 %	This is a portfolio of tasks which students will complete throughout the year. This strategy helps students to consolidate the taught content immediately after lectures.
Set Exercise - Component B		5 %	UWE library workbook
Resit Components	**Final Assessment**	**Element weighting**	**Description**

Examination (Online) - Component A	✓	50 %	2 hour examination
Written Assignment - Component B		45 %	A combination of tasks related to mathematics and problems of computational theory.
Set Exercise - Component B		5 %	UWE library workbook

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
Apply an understanding of numbers, sets, functions, relations and propositional logic to real life problems.	MO1
Design and simulate simple digital circuits	MO2
Design and simulate abstract computation models	MO3
Define the syntax of formal languages in terms of productions in order to understand how compilers work	MO4
Define functions using recursion and explain algorithmic behaviour of programs in appropriate formal terms and Big-O notation.	MO5
Extract general principles from studying particular problems and solutions and the application of research.	MO6

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	228
Total Independent Study Hours:	228
Scheduled Learning and Teaching Hours:	
Face-to-face learning	72
Total Scheduled Learning and Teaching Hours:	72
Hours to be allocated	300
Allocated Hours	300

Reading List

The reading list for this module can be accessed via the following link:

https://rl.talis.com/3/uwe/lists/DD9641ED-91B9-4A88-DAFF-51C9E8B7EC91.html?lang=en-GB&login=1

Part 5: Contributes Towards
This module contributes towards the following programmes of study: Computing [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21 Computer Science [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21 Computer Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2020-21 Computing {Dual} [Aug][SW][Taylors][4yrs] BSc (Hons) 2020-21 Computing [Sep][FT][Frenchay][3yrs] BSc (Hons) 2020-21 Software Engineering for Business [Sep][FT][Frenchay][3yrs] BSc (Hons) 2020-21 Software Engineering for Business [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21 Computing {Dual} [Aug][FT][Taylors][3yrs] BSc (Hons) 2020-21 Computing {Dual} [Mar][FT][Taylors][3yrs] BSc (Hons) 2020-21 Computing {Dual} [Mar][SW][Taylors][4yrs] BSc (Hons) 2020-21