Module Descriptor

Title	Python Fundamentals		
Session	2025/26	**Status**	Published
Code	MATH07008	**SCQF Level**	7
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	Dr Wan R Mekwi		

Summary of Module

This module will teach students the fundamentals of programming in Python. It is suitable for students of all STEM fields.

Students will learn to write basic computer programs to solve real-world STEM problems. They will learn how to generate, manipulate, analyse and visualise data. As well as programming and simulation skills, students will develop an understanding of how problems can be simulated and/or solved within a computer-based numerical environment.

Fundamentals of programming will be explored including using conditional statements and looping, modularising code via user-defined functions, and creating and manipulating mathematical functions.

Students will also be introduced to the concept of cybersecurity and its importance in storing, protecting and sharing professional and personal data.

This module will work to develop a number of the key 'I am UWS' Graduate Attributes to make those who complete this module:

Universal:

- academic: analytical, critical thinker, inquiring

- professional: collaborative

Work-ready:

- academic: Knowledgeable, digitally literate

- personal: motivated

- professional: enterprising

Successful:

- academic: autonomous, incisive, innovative

- personal: creative, imaginative, resilient

- professional: driven, daring

Module Delivery Method	On-Campus[1] ☒	Hybrid[2] ☐	Online[3] ☐	Work -Based Learning[4] ☐
Campuses for Module Delivery	☐ Ayr ☐ Dumfries	☐ Lanarkshire ☐ London ☒ Paisley	☐ Online / Distance Learning ☐ Other (specify)	

Terms for Module Delivery	Term 1	☐	Term 2	☒	Term 3	☐
Long-thin Delivery over more than one Term	Term 1 – Term 2	☐	Term 2 – Term 3	☐	Term 3 – Term 1	☐

Learning Outcomes	
L1	Develop computer algorithms and programs to solve STEM problems
L2	Generate, manipulate, analyse and visualise programming and simulation data
L3	Generate coherent reports based on output of computer programs
L4	Demonstrate how security measures are used to protect data, networks and software
L5	

Employability Skills and Personal Development Planning (PDP) Skills	
SCQF Headings	**During completion of this module, there will be an opportunity to achieve core skills in:**
Knowledge and Understanding (K and U)	**SCQF 7** Basic knowledge of the structure of a high-level language. Structuring problems in a suitable format for program development and presentation. General knowledge and understanding of security measures are used to protect data, networks and software.
Practice: Applied Knowledge and Understanding	**SCQF 7** Develop limited computer applications using a high-level language. Present information using commonly available libraries. Demonstrate how security measures are used to protect data, networks and software.

[1] Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

[2] The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

[3] Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

[4] Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

	Select and critically evaluate technical literature and other sources of information to solve complex problems. Through the development of algorithms, programs and simulations, apply an integrated or systems approach to the solution of complex problems. Use practical computer laboratory skills to investigate complex problems. Adopt a holistic and proportionate approach to the mitigation of security risks.
Generic Cognitive skills	**SCQF 7** Use appropriate quantitative science and engineering tools to gather data in an appropriate format. Use logical and analytical skills to formulate and understand computer programs in a high-level scripting language
Communication, ICT and Numeracy Skills	**SCQF 7** Demonstrate the ability to communicate ideas and concepts through the use of presentation software. Demonstrate an understanding of the computer techniques available to enhance the communication of science and engineering ideas and concepts. Use computers to automate repetitive tasks. Use a high-level programming language to enhance the effectiveness of a computer in the context of modern work tasks.
Autonomy, Accountability and Working with Others	**SCQF 7** Develop an enhanced level of transferable skills that will be of value in working with others in more complex situations. Function effectively as an individual and as a member or leader of a team. Be able to demonstrate the effectiveness of the team's performance and individual contribution.

Prerequisites	**Module Code**	**Module Title**
	Other	
Co-requisites	**Module Code**	**Module Title**

Learning and Teaching	
In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.	
Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Note: Learning hours include both contact hours and hours spent on other learning activities)

Lecture / Core Content Delivery	12
Laboratory / Practical Demonstration / Workshop	24
Independent Study	164
Please select	
Please select	
Please select	
TOTAL	200

Indicative Resources

The following materials form essential underpinning for the module content and ultimately for the learning outcomes:

"A practical Introduction to Python Programming" – B. Heinold

"Introduction to Scientific Programming with Python" – J. Sundnes

"Openstax: Introduction to Python Programming"

(N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)

Attendance and Engagement Requirements

In line with the Student Attendance and Engagement Procedure, Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.

For the purposes of this module, academic engagement equates to the following:

The School of Computing, Engineering and Physical Sciences considers attendance and engagement to mean a commitment to attending, and engaging in, timetabled sessions. You will scan your attendance via the scanners each time you are on-campus and you will login to the VLE several times per week. Where you are unable to attend a timetabled learning session due to illness or other circumstance, you should notify the Programme Leader that you cannot attend. Across the School an 80% attendance threshold is set. If you fall below this, you will be referred to the Student Success Team to see how we can best support your studies.

Equality and Diversity

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code.

Aligned with the University's commitment to equality and diversity, this module supports equality of opportunity for students from all backgrounds and learning needs. Using the VLE, material will be presented electronically in formats that allow flexible access and manipulation of content. This module complies with University regulations and guidance on inclusive learning and teaching practice. This module has lab-based teaching and as such you are advised to speak to the Module Co-ordinator to ensure that specialist assistive equipment, support provision and adjustment to assessment practice can be put in place, in accordance with the University's policies and regulations.

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

Supplemental Information

Divisional Programme Board	**Engineering Physical Sciences**
Overall Assessment Results	☐ **Pass / Fail** ☒ **Graded**
Module Eligible for Compensation	☒ **Yes** ☐ **No** **If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.**
School Assessment Board	Computing, Engineering and Physical Sciences
Moderator	Dr Kwok Chi Chim
External Examiner	P. Wilson
Accreditation Details	TBCA portfolio of practical work (a series of programming tasks) (50%)
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	2.0

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
A portfolio of practical work (a series of programming tasks) (50%)
Assessment 2
A portfolio of practical work (applications to engineering, science or data analysis) (50%)
Assessment 3
(N.B. (i) Assessment Outcomes Grids for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed. (ii) An indicative schedule listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)

Component 1							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Portfolio 1	☒	☒	☒	☒	☐	50	

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Portfolio 2	☒	☒	☒	☒	☐	50	

Component 3							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
	☐	☐	☐	☐	☐		
Combined total for all components						100%	hours

Change Control

What	When	Who
New module name	02/04/2025	R. Meeten