Module Descriptor

Title	Intermediate Programming		
Session	2025/26	**Status**	Published
Code	COMP08103	**SCQF Level**	8
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	Aboua Ange Kevin N'DA		

Summary of Module

This module aims to further advance the students' rudimentary programming knowledge by introducing them to the fundamentals of object-oriented programming (OOP). This will be accomplished by utilizing a suitable high-level programming language such as C# or Java, which should ideally differ from the one introduced in previous programming modules, thereby enabling students to become comfortable with polyglot programming.

The module will cover key terminology, pillars, and principles that make up object-oriented programs. It will not only equip students with the knowledge and skills to develop scalable, maintainable, and reusable software but also foster a deep understanding of problem-solving strategies and best practices in software development.

- Introduction to OOP Fundamentals:
  - Key Concepts: Classes, Objects, Instances, Variables (Instance and Static)
  - OOP Pillars: Abstraction, Encapsulation, Inheritance, Polymorphism
  - OOP Principles: SOLID, DRY

- OOP Techniques
  - Constructors, Overloading
  - Abstract Classes and Interfaces
  - Single and Multiple Inheritance

- Advanced Language Features
  - Generics, Enumerations and Collections
  - Handling Exceptions, Assertions, and Logging
  - Anonymous Functions and Lambda Expressions

- Good Coding Practices

- Finding and Incorporating Libraries and Library Classes from the Language's API
- Documenting code
- Debugging
- Developing Software Applications
- Regular Expressions
- Serialization and File I/O
- Database connections and suitable design patterns
- Building a GUI

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

- Universal: Critical Analytical; Ethically-minded and Research-minded
- Work Ready: Problem-Solver; Effective Communicator; and Ambitious
- Successful: Autonomous, Resilient; and Imaginative

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) Online Delivery / Distance Learning applies to delivery in the BSc (Hons) Data, AI and Software Engineering programme only	

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	☐

[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

Learning Outcomes	
L1	Demonstrate an understanding of common object-oriented concepts and principles and apply these in building a software system.
L2	Demonstrate expertise in the use of an integrated software development environment and its tools in the design, documentation, and implementation of a software system.
L3	Apply suitable techniques and practices to create scalable, maintainable, secure and reusable code to develop software systems
L4	Develop and test an object-oriented software application that follows OOP principles, uses suitable language features, and incorporates the use of standard library APIs as well as data persistence
L5	N/A

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 8** Demonstrate broad and integrated knowledge and understanding of the principles, principal theories, concepts terminology associated with object-orientated programming.
Practice: Applied Knowledge and Understanding	**SCQF 8** Design and develop object-oriented programs, making use of advanced programming language features. Use an integrated software development environment to adapt standard practices in developing software systems effectively
Generic Cognitive skills	**SCQF 8** Critically evaluate the source code of object-oriented programs, taking account of a range of considerations including reusability, maintainability, security and other aspects of the problem scenario. Communicating effectively and appropriately in speech and writing. Interpreting complex primary materials. Making effective use of information retrieval systems and use information technology applications to present documents in an appropriate form.
Communication, ICT and Numeracy Skills	**SCQF 8** Communicating effectively and appropriately in speech and writing. Interpreting complex primary materials. Making effective use of information retrieval systems and use information technology applications to present documents in an appropriate form.
Autonomy, Accountability and Working with Others	**SCQF 8** Exercise autonomy and initiative at a professional level in the design, development and testing of applications.

Prerequisites	**Module Code** COMP07027	**Module Title** Introduction to Programming

	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	18
Laboratory / Practical Demonstration / Workshop	24
Tutorial / Synchronous Support Activity	6
Independent Study	152
Please select	
Please select	
TOTAL	200

Indicative Resources
The following materials form essential underpinning for the module content and ultimately for the learning outcomes: Bates, K. (2021) Head First Java, 3rd Edition. S.L.: O'reilly Media, Inc, Usa. Martin, R.C. (2010) Clean code a handbook of agile software craftmanship. Upper Saddle River [Etc.] Prentice Hall. Mclaughlin, B., Pollice, G. and West, D. (2007) Head first object-oriented analysis and design. Beijing: O'reill Weisfeld, M. (2018) Object-Oriented Thought Process.
(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	**Computing**
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	Business & Applied Computing
Moderator	Rebecca Redden
External Examiner	TBC
Accreditation Details	
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	1.1

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Portfolio of practical work: A coursework to be submitted at the end of the module demonstrating the practical application of the programming principles and techniques taught by implementing a software solution to a given problem. (100%)
Assessment 2
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 of practical work	☒	☒	☒	☒	☐	100	

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

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**
Attendance and EDI Updates	17/01/2025	L Cunningham
Assignment of module coordinator & moderator. Update of CPD and Module Eligible for Compensation.	21/02/2025	Aboua Ange Kevin N'DA