Module code: MOD003263	Version: 20 Date Amended: 27/Nov/2025

1. Module Title

Software Engineering

2a. Module Leader

Cristina Luca

2b. School

School of Computing and Information Sciences

2c. Faculty

Faculty of Science and Engineering

3a. Level

5

3b. Module Type

Standard (fine graded)

4a. Credits

30

4b. Study Hours

300

5. Restrictions

Type	Module Code	Module Name	Condition
Pre-requisite:	MOD003212	Introduction to Programming	Compulsory
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:			

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

This module provides an in-depth exploration of the software development life cycle, covering all key stages from requirements analysis and system modelling to design, implementation, testing and maintenance. You will gain both theoretical understanding and practical experience in applying software engineering principles to the development of robust and scalable software systems.

Through hands-on learning, you will look into the difference between the Waterfall and Agile methodologies, using Agile for project management and exploring cost drivers that influence software projects. You will also work with industry-standard version control tools to manage source code and collaborate effectively within a team.

Building on knowledge gained in earlier modules, you will model and design software systems using a range of diagrams and architectural design techniques, applying design patterns to create maintainable and efficient solutions. Both automated and manual testing methods will be introduced, enabling you to demonstrate the ability to plan and execute comprehensive testing strategies.

A distinctive feature of this module is its real-world case study, developed in collaboration with industry partners. This ensures that the learning experience is grounded in professional practice, with employers providing authentic project scenarios and feedback at the end of the trimester. The module has been shaped based on employer input to reflect current industry expectations, technical demands and teamwork dynamics.

By integrating industry collaboration and practical experience, this module is a key component in preparing students for placements and future employment. It develops essential professional and technical competencies - from teamwork and communication to project delivery and quality assurance - that are highly valued by employers across the software engineering sector.

6b. Outline Content

Review of the software requirements, design, and cost drivers using appropriate OOP concepts. Discuss two types of project management waterfall and agile methodologies Software Development: write code that complies with UML diagrams, connect and manipulate a database, develop a User Interface. Software Validation and Verification Project and Cost Management Software and Project Quality Management. The students will be organised in groups, each group member having a certain role. They will work through two case studies using an appropriate methodology such as Agile.

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

Access to a laboratory with an UML modelling tool and a software development environment supporting the development of computer programs in an object-oriented programming language such as C# or Java.

7. Learning Outcomes (threshold standards)		
No.	Type	On successful completion of this module the student will be expected to be able to:
1	Knowledge and Understanding	Apply and critically appraise software engineering approaches to developing software applications, and discuss the role of quality management systems and continuous improvement.
2	Knowledge and Understanding	Understand, select and apply key object-oriented design principles, recognising their limitations.
3	Knowledge and Understanding	Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for problem identification and analysis, software design, implementation, verification, and documentation.
4	Intellectual, practical, affective and transferrable skills	Work effectively as part of a team to design, develop and deliver quality software artefacts, communicate effectively the results to technical and non-technical audiences, and record own learning and development.
5	Intellectual, practical, affective and transferrable skills	Use a software development environment supporting the development of computer programs to develop a software application that meets a combination of societal, user, business and customer needs as appropriate.

8a. Module Occurrence to which this MDF Refers				
Year	Occurrence	Period	Location	Mode of Delivery
2025/6	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	Hours	Learning Outcomes	Details of Duration, frequency and other comments
Lectures	36	1 - 5	Lecture 3 hr x 12 weeks
Other teacher managed learning	24	1, 4, 5	Practical Lab 2 hr x 12 weeks
Student managed learning	240	1 - 5	Self-study and research
TOTAL:	300		

9. Assessment for the above Module Occurrence

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
010	Coursework	1-5	100 (%)	Fine Grade	30 (%)

Multiphase group-based assessment. Equivalent of 6000 words per group member. Specification, design, implementation, evaluation including group performance.

Assessment components for Element 010

Component No.	Assessment Title	Submission Method	Weighting (%)	Components needed for Mark Calculation?
010/1	Report	Canvas	85 (%)	
010/2	Demonstration	Scheduled Activity: Timetabled assessment task	15 (%)	All

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]