

Module Code	Pre-requisite Module codes	Co-Requisite Modules code(s)	ISCED Code	Subject Code	ECTS Credits	NFQ Level (CPD)#
CMPU 3037	CMPU 2029				10	7
Module Title	Software Engineering					

Software Engineering

School Responsible:	School of Computing
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Module Overview:

This module focuses on an engineering approach to systems' development. The module studies systems analysis and design in the context of object oriented development. On successful completion of the course, students are expected to be able to apply object oriented analysis and design techniques. Students are also expected to appreciate and understand the different approaches to object oriented design and testing.

The aims of this module are to:

- Give the student a sound understanding and competence in the principles and application of Object Oriented Requirements Specification, Analysis and Design using an appropriate development process.
- Ensure the student has a good understanding of the principal models and techniques used in Object Oriented Analysis and Design.
- Provide the student with practical experience of applying these techniques to a case study and gain competence in the use of a CASE tool in the development of the models.
- Teach the principal testing strategies and techniques in Object Oriented Development.

Learning Outcomes (LO):

On Completion of this module, the learner will be able to

1	Use appropriate techniques to gather the requirements and produce a requirements specification for an application
2	Use appropriate methods and techniques to create object oriented analysis and design models.
3	Evaluate and use the various tools available to support the modelling and code generation process.

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4	Identify appropriate software architectures, patterns, components and frameworks in the design of a system
5	Identify an appropriate test process and design test cases.
6	Understand the relationship between Software Engineering concepts/models and their Object Oriented implementation.

Indicative Syllabus:

- Software Development Process: Introduction to an Object Oriented iterative process: Inception, Elaboration, Construction and Transition.
- Review of requirements gathering techniques.
Object Oriented Requirements and Analysis Modelling: Use Cases, Use Case Specifications, Business Class Diagrams including inheritance, attributes, methods, messaging and associations. Activity Diagrams
- Analysis and Design Techniques: Refining the Requirements Model, adding Attributes, Operations and their specifications to the classes. Further class modelling including Encapsulation, Abstraction, Objects
Instances, Polymorphism with reference to Object Oriented OO language implementations where appropriate.
- Object interaction and Collaboration, Messages modelled on the Sequence Diagram. State Machine Diagram.
- Systems Design and Implementation: Adding Association, Boundary and Control Classes. Simple Subsystems.
Reusable Design Patterns. Architectures, Frameworks, Components and Reuse. Three-tier and Model-View-Controller models. Introduction to relevant technologies. Packages and Deployment Diagrams.
- Mapping persistent classes to a Relational Database Model.
- Forward and Reverse Engineering between models and code.
- Testing Object Oriented Systems: Testing Analysis and Design Specifications and the built system.

Learning and Teaching Methods:

The course delivery involves a combination of lectures and labs which may incorporate the use of blended learning techniques as appropriate throughout the delivery.

Total Teaching Contact Hours	39
Total Self-Directed Learning Hours	148

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Module Delivery Duration:

This module is delivered over one semester

Assessment

Assessment Type	Weighting (%)	LO Assessment (No.)
Final Exam	60%	1,2,4,5,6
In Class Assessment	40%	1-4
Module Specific Assessment Arrangements (if applicable)		
(a) Derogations from General Assessment Regulations		
(b) Module Assessment Thresholds		
(c) Special Repeat Assessment Arrangements		

Essential Reading: (author, date, title, publisher)

- Ian Sommerville, 2015, Software Engineering, 10th Edition, Pearson.
- S. Bennett, S. McRobb and R. Farmer, 2010, Object-Oriented Systems Analysis and Design using UML, 4rd Ed , McGraw-Hill.

Supplemental Reading

- Wazlawick, 2014, Object-Oriented Analysis and Design for Information Systems, 1st Edition, Modeling with UML, OCL, and IFML, Morgan Kaufmann.
- R. Pressman, 2014, Software Engineering: A Practitioner's Approach., 8th Ed., McGraw Hill.

Version No:		Amended By	
Commencement Date		Associated Programme Codes	

Modules that are to be offered as Stand-Alone CPD Programmes must have an NFQ level assigned

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*Details of the assessment schedule should be contained in the student handbook for the programme stage.

Date of Academic Council approval

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