Module Specification

Module Summary Information

1	**Module Title**	Software Design
2	**Module Credits**	20
3	**Module Level**	5
4	**Module Code**	CMP5354

5	**Module Overview**

This module is about software engineering with a focus on software design. It covers three stages of the software engineering life-cycle, requirements, design and implementation, but with a focal point on design and an emphasis on the design theme. The module provides the necessary skills to: (i) construct models of requirements and designs, (ii) synthesise implementations from design models, (iii) and apply software design patterns. The standard UML is used as the modelling language, the vehicle through which important design concepts are explored to convey a software engineering ethos based on getting it right by adequately studying the problem and mindfully constructing designs of software solutions.

The module will be delivered using both lectures and practical classes on a weekly basis. The module's provided educational resources will be made available on Moodle; additional resources will be available in the library for self-study. A significant learning component is the group coursework, which will involve constructing a requirements documents and a design of a software-based system following the steps and techniques instilled in the face-to-face teaching and learning activities of the module. The assessment will involve the group coursework, which will be partitioned into deliverables, each with its own report, and an individual assessment. All assessment components are summatively assessed with the final mark attesting the extent to which students have fulfilled the learning outcomes.

6	**Indicative Content**

The module's indicative content is as follows:

- Identify and explain concepts, notions and approaches related to software design and requirements engineering;
- Construct requirements use-case models based on UML use case diagrams and accompanying use-case specifications;
- Draw UML class diagrams to describe data (or domain) models
- Draw system sequence diagrams to describe interactions of systems with environment
- Write operation contracts, based on pre- and post-conditions, using natural language.
- Construct UML-based models with behaviour expressed as statecharts.
- Validate models using snapshots based on object diagrams.
  Synthesise implementations from UML-based designs.
- Explain the software engineering notion of design patterns and identify relevant design patterns.

7	Module Learning Outcomes On successful completion of the module, students will be able to:	
	1	Analyse, model and document the requirements of a system in an appropriate format to derive a clear understanding of the problem
	2	Construct design models of software-based systems covering both their static and dynamic aspects, documenting in professional manner.
	3	Synthesise software implementations from software designs.
	4	Explain the software engineering notion of design patterns, and identify and apply relevant design patterns

8	Module Assessment			
Learning Outcome				
		Coursework	Exam	In-Person
1-4		X		

9	Breakdown Learning and Teaching Activities	
Learning Activities		Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable		48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE		75
Private Study (PS) includes preparation for exams		77
Total Study Hours:		200