CHK4001CM: Software Design

Module Level	4
Learning Credits	20
Assessment Credits	10
Total Student Study Hours	100

Aims and Summary

The purpose of this module is to equip students with the concepts of software based systems development and principles of software design used by industry. It provides a practical guide to the software development process with associated tools and techniques. The module focuses on modern iterative process models using modelling methods and tools. This includes techniques for requirements engineering and analysis, architectural style and detailed software design with patterns, and follows these through to software implementation and testing. The module also gives an overview of project management and activities related to a defined process model. This includes the importance of social, professional, legal and ethical standards as well as the transferable skills needed in a professional role.

Intended Module Learning Outcomes

On completion of this module the student should be able to:

1. Understand and apply appropriate concepts, tools and techniques to each stage of the software development.
2. Understand and apply design patterns to software components in developing new software.
3. Demonstrate an understanding of project planning and working to agreed deadlines, along with professional, interpersonal skills and effective communication required for software production.
4. Demonstrate a clear understanding of software based systems and apply general principles in modelling software based solutions.
5. Demonstrate an awareness of, and ability to apply, social, professional, legal and ethical standards as documented in relevant laws and professional codes of conduct.

Indicative Content

Agile development: use of scrum, user stories and mapping techniques, Kanban boards and burndown charts.

Programming: unit and integration testing.

Design Patterns: creational (factory, proxy, singleton), structural (adaptor, decorator).

Version Control: use of Git version control, local and remote repositories, use of Git shell commands.

In-process communication: building custom modules to encapsulate business logic, test-driven development.

Out of process communication: use of existing APIs to add functionality.

Usability: basic usability testing.

Modelling Tools: UML, class diagrams, entity-relationship diagrams.

Ethics: basic ethics.

Special Features

None

Teaching and Learning

Learning will be facilitated through a variety of methods which may include lectures, labs, online activities and group work.

Students are expected to engage in both class and online activities and discussions. This module also requires students to participate in additional guided reading and self-directed study to reinforce the learning gained from timetabled sessions. Formative assessment will be used to prepare students for summative assessment and give students an early indication of their progress towards the course intended learning outcomes.

Note that the hours below do not add up to the usual 200 for a 20 credit module. This is because the module has only 10 assessment credits, with the other 10 being given to the Course Project module CHK4039CEM. The total number of hours for all modules in the semester add up to the usual 600.

Method of Delivery

Activity Type	Hours
Demonstration	
External Visits	
Fieldwork	
Guided	
Laboratory	
Lecture	24
Placement	
Practice	
Project Supervision	
Self guided	76
Seminar	
Studio	
Tutorial	
Work Based Learning	
Workshop	
Year Abroad	
Total	100

Method of Assessment (normally assessed as follows)

Assessment	Component Type	Credits	Learning Outcomes				
			1	2	3	4	5
Tst	Applied Core	10	✓	✓	✓	✓	✓

The Tst component is a 1 hour end of term online quiz.

Re-assessment is through a new test

Note that the content of this module is also assessed by the first Activity Led Learning Project CHK4039CEM.

Passing Requirements

Test must be at least 40% and Module Mark must be at least 40%.

Essential Reading

Recommended Reading

1. Allbee, B. (2018) *Hands-On Software Engineering with Python: Move beyond basic programming and construct reliable and efficient software with complex code*, Packt Publishing
2. Cole, R. and Scotcher, E. (2015) *Brilliant Agile Project Management: A Practical Guide to Using Agile, Scrum and Kanban*, Pearson Business, 1st edition.
3. Cottrell, S. (2013) *The Study Skills Handbook.* Palgrave Macmillan, UK. 4th Edition.
4. Cottrell, S. (2015) *Skills for Success: Personal Development and Employability*. Palgrave Macmillan, UK. 3rd Edition.

Required Equipment

None