Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: Software Engineering

Unit ID: ITECH3506

Credit Points: 15.00

Prerequisite(s): (ITECH2306)

Co-requisite(s): Nil

Exclusion(s): (ITECH2309 and ITECH3201)

ASCED: 020305

Description of the Unit:

This unit builds upon programming skills that students have already developed. This unit will address important software engineering issues involving various stages of the software development lifecycle, including the elicitation of user requirements and design of complex systems. Students will develop an understanding of underlying software engineering principles and techniques, and make use of industry-standard tools.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory						

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Intermediate						
Advanced			✔			

Learning Outcomes:

Knowledge:

K1. Describe fundamental software engineering and software architecture concepts.

K2. Describe the requirements elicitation and design phases of the software development life cycle.

K3. Compare and contrast common software development methodologies.

K4. Explain how software developers use models to analyse and modify software systems.

Skills:

S1. Apply software engineering principles to design and implement software applications.

S2. Operate CASE software to develop appropriate models of software systems.

S3. Develop comprehensive unit test suites.

S4. Specify and justify the software architecture and software design for a proposed system considering various views and viewpoints

Application of knowledge and skills:

A1. Write integrated reports, using appropriate models, providing detailed analysis and/or design of systems based on provided textual scenarios.

A2. Develop software applications, using appropriate software engineering techniques, to address a complex scenario.

Unit Content:

Topics may include:

- Software Engineering fundamentals.
- Systems Development Life Cycle (SDLC).
- Requirements analysis and modelling systems requirements.
- Object-oriented system analysis and design.
- Software Architecture
- Design Patterns
- Computer Aided Software Engineering and UML.
- Software testing
- Software maintenance.
- Software Engineering standards.

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	Students will demonstrate the ability to effectively communicate, inter-act and work with others both individually and in groups. Students will be required to display skills in-person and/or online in: • Using effective verbal and non-verbal communication • Listening for meaning and influencing via active listening • Showing empathy for others • Negotiating and demonstrating conflict resolution skills • Working respectfully in cross-cultural and diverse teams.	Not applicable	Not applicable
FEDTASK 2 Leadership	Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in: • Creating a collegial environment • Showing self -awareness and the ability to self-reflect • Inspiring and convincing others • Making informed decisions • Displaying initiative	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: • Reflecting critically • Evaluating ideas, concepts and information • Considering alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts • Forming creative solutions in problem solving.	A2	AT1

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	**Assessment task (AT#)**
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: • Finding, evaluating, managing, curating, organising and sharing digital information • Collating, managing, accessing and using digital data securely • Receiving and responding to messages in a range of digital media • Contributing actively to digital teams and working groups • Participating in and benefiting from digital learning opportunities.	Not applicable	Not applicable
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: • Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts • Committing to social responsibility as a professional and a citizen • Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Embracing lifelong, life-wide and life-deep learning to be open to diverse others • Implementing required actions to foster sustainability in their professional and personal life.	Not applicable	Not applicable

Learning Task and Assessment:

Students should complete all lab exercises during the semester (some of which are assessable). Students should participate in lectures, tutorials / lab classes and maintain a portfolio with notes and exercises. Notes should be enhanced by guided reading.

Assessable tasks: The assessment for this unit may include at least one team assignment requiring the design and implementation of a moderately sized application (possibly client and server). Assignments and class exercises will enable students to demonstrate their mastery of specific concepts and skills. Tests will test the knowledge and understanding of the concepts across the whole unit.

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K4, S1, S2, S3, S4, A1, A2	Students will use object-oriented programming constructs and software engineering methodologies and practices to analyse, design, implement and document software solutions. At least one assignment involves working in a team and presenting the software solution to the class.	Assignments, Projects, Presentations	60-80%
K1, K2, K3, K4, S1, S2, S3, S4	Students will be required to complete tasks during weekly lab sessions. Some of these lab sessions will be marked requiring the student to either demonstrate a skill, or to explain something they have done that relates to the learning outcomes of the task.	Lab work demonstrations and explanations	0-30%
K1, K2, K3, K4, S1, S3, S4	Students will provide theoretical answers and provide practical solutions to a range of questions and problem types drawn from theory, assignments and examples used during this unit.	Tests / Examinations	10-30%

Adopted Reference Style:

APA

Refer to the library website for more information

Fed Cite - referencing tool