

SUBJECT OUTLINE**Subject code and name**

SEP401 Software Engineering Principles

SECTION 1 – GENERAL INFORMATION**1.1 Administrative details**

Associated award/s	Duration	Level
Graduate Certificate of Software Engineering Graduate Diploma of Software Engineering (Artificial Intelligence) Graduate Diploma of Software Engineering (Cloud Computing) Master of Software Engineering (Artificial Intelligence) Master of Software Engineering (Cloud Computing) Master of Software Engineering (Artificial Intelligence, Advanced) Master of Software Engineering (Cloud Computing, Advanced)	1 Trimester (12 weeks, or intensive over 6 weeks)	400

1.2 Core or elective subject

- ☒ core subject (within associated awards)
- ☐ elective subject (within associated award/s, and in other approved awards)
- ☐ other (please specify below):

1.3 Subject weighting

Subject credit points	Total course credit points
10	Graduate Certificate: 60 Graduate Diploma: 80 Master: 120 Master, Advanced: 160

1.4 Student workload

Duration	Facilitated study h/p/w	Personal study h/p/w	Total study h/p/w
12-week duration	3	7	10
6-week duration	6	14	20

1.5 Delivery mode

- ☒ Face-to-face
☒ Online
☐ Intensive (e.g. residential, or summer school, weekend workshop - details below)

- ☐ Work-integrated learning activity
☒ Hybrid
☒ Full-time
☐ Part-time
☐ Other (please specify)

1.6 Pre-requisites and co-requisites

- ☐ Yes ☒ No

If YES, provide details of the prerequisite or co-requisite requirements below.

1.7 Specialist facilities and/or equipment requirements

- ☒ Yes ☐ No

If YES, provide details of specialist facilities and/or equipment below.

Computer/laptop and relevant specialist software.

SECTION 2 – ACADEMIC DETAILS

2.1 Subject Descriptor

In this subject students are introduced to the current Software Engineering standards and processes, with the aim of enabling them to analyse, design, and implement software projects that follow certain quality measures at every stage of the Software Development Life Cycle. The subject covers requirements engineering, modelling and design of software, software architecture, verification and validation of software systems, and other topics that are related to the software engineering practices.

2.2 Subject Learning Outcomes

Subject Learning Outcomes	Mapping to Course Learning Outcomes
a) Demonstrate different software engineering principles and techniques.	GCSE: CLO1, CLO5 GDSE(AI): CLO1, CLO5 GDSE(CC): CLO1, CLO5 MSE(AI): CLO1, CLO5 MSE(CC): CLO1, CLO5 MSE(AI,Adv): CLO1 MSE(CC,Adv): CLO1
b) Author documents required for the software development process e.g.: formal specifications, requirements document, test plan.	GCSE: CLO1, CLO2 GDSE(AI): CLO1, CLO2 GDSE(CC): CLO1, CLO2 MSE(AI): CLO1, CLO2 MSE(CC): CLO1, CLO2 MSE(AI,Adv): CLO1, CLO2 MSE(CC,Adv): CLO1, CLO2
c) Design, develop, maintain and evaluate software systems.	GCSE: CLO3, CLO4 GDSE(AI): CLO3, CLO4 GDSE(CC): CLO3, CLO4 MSE(AI): CLO4 MSE(CC): CLO4 MSE(AI,Adv): CLO4 MSE(CC,Adv): CLO4
d) Produce high quality software solutions.	GCSE: CLO2, CLO3 GDSE(AI): CLO2, CLO3 GDSE(CC): CLO2, CLO3 MSE(AI): CLO2 MSE(CC): CLO2 MSE(AI,Adv): CLO2 MSE(CC,Adv): CLO2
e) Meet the core ethical standards of the software development process and legal responsibilities.	GCSE: CLO1, CLO3 GDSE(AI): CLO1, CLO3 GDSE(CC): CLO1, CLO3 MSE(AI): CLO1 MSE(CC): CLO1 MSE(AI,Adv): CLO1 MSE(CC,Adv): CLO1

* The full list of Course Learning Outcomes and their descriptors is provided in Section 2.6 below.

2.3 Assessment Tasks

12-week duration

No.	Type and Description	Assessment due	Weighting	Subject Learning Outcome(s) assessed
1.	<p>Delivery type: Individual/Collaborative Outcome: Report Mode: Multimodal</p> <p>Part A: Proposal Prepare the proposal document for a software application intended for a stakeholder. (2 pages maximum)</p> <p>Part B: Problem Analysis Prepare the Requirement Specification Document for a software application specified in the brief. (10 pages maximum)</p>	<p>Module 3 (Week 3)</p> <p>Module 5 (Week 5)</p>	<p>10%</p> <p>20%</p>	a, b,
2.	<p>Delivery type: Individual/Collaborative Outcome: Report Mode: Multimodal</p> <p>Problem Analysis Based on the feedback from the prepared requirement document in assessment 1 develop the Software Design Document. (50 pages maximum)</p>	Module 9 (Week 9)	35%	a, b, c
3.	<p>Delivery type: Individual/Collaborative Outcome: Software Application & Presentation Mode: Multimodal</p> <p>Final Project Develop the Software Application according to the proposed design document and prepare a presentation summarising the whole software process. (presentation duration 12 minutes maximum)</p>	Wednesday, Module 12 (Week 12)	35%	c, d, e

6-week duration

No.	Type and Description	Assessment due	Weighting	Subject Learning Outcome(s) assessed
1.	<p>Delivery type: Individual/Collaborative Outcome: Report Mode: Multimodal</p> <p>Part A: Proposal Prepare the proposal document for a software application intended for a stakeholder. (2 pages maximum)</p> <p>Part B: Problem Analysis Prepare the Requirement Specification Document for a software application specified in the brief. (10 pages maximum)</p>	<p>Module 3 (Week 2)</p> <p>Module 5 (Week 3)</p>	<p>10%</p> <p>20%</p>	a, b,
2.	<p>Delivery type: Individual/Collaborative Outcome: Report Mode: Multimodal</p> <p>Problem Analysis Based on the feedback from the prepared requirement document in assessment 1 develop the Software Design Document. (50 pages maximum)</p>	Module 9 (Week 5)	35%	a, b, c
3.	<p>Delivery type: Individual/Collaborative Outcome: Software Application & Presentation Mode: Multimodal</p> <p>Final Project Develop the Software Application according to the proposed design document and prepare a presentation summarising the whole software process. (presentation duration 12 minutes maximum)</p>	Wednesday, Module 12 (Week 6)	35%	c, d, e

2.4 Prescribed texts

These are core texts that are fundamental to meeting subject outcomes. Students may choose to purchase a copy. A limited number of these texts will be available for loan from the campus library.

There are no prescribed texts.

2.5 Suggested readings and resources

These are supplementary readings and resources that support subject knowledge. These may be available from the campus library. Refer to *SEP401 Software Engineering Principles* suggested readings and resources for the list of readings and resources.

Policies and Procedures, and related application forms, are available via the THINK or Torrens University Australia website.

2.6 Course Learning Outcomes

Course Learning Outcome Code	Course Title: Graduate Certificate of Software Engineering Course Learning Outcome Descriptor
CLO 1	Analyse and integrate cognitive and technical skills from the software engineering body of knowledge to tackle complex commercial software engineering problems with innovation and ethical practice.
CLO 2	Critically analyse problem sets to synthesise acute software engineering solutions and communicate recommendations, conclusions and professional decisions to both expert and novice audiences.
CLO 3	Innovatively apply highly specialised and integrated software engineering knowledge to a diverse variety of technical problems including those related to emerging technologies.
CLO 4	Demonstrate sound judgement, non-partisanship and accountability as part of leadership role in a team to achieve effective planning, management, execution and communication.
CLO 5	Communicate technical solutions, recommendations and workarounds efficiently to a variety of audiences, including diverse multi-cultural groups.

Course Learning Outcome Code	Course Title: Graduate Diploma of Software Engineering (Artificial Intelligence) Course Learning Outcome Descriptor
CLO 1	Analyse and integrate cognitive and technical skills from the software engineering body of knowledge to tackle complex commercial software engineering problems with innovation and ethical practice.
CLO 2	Critically analyse problem sets to synthesise acute software engineering solutions and communicate recommendations, conclusions and professional decisions to both expert and novice audiences.

CLO 3	Innovatively apply highly specialised and integrated software engineering knowledge to a diverse variety of technical problems including those related to emerging technologies.
CLO 4	Demonstrate sound judgement, non-partisanship and accountability as part of leadership role in a team to achieve effective planning, management, execution and communication.
CLO 5	Communicate technical solutions, recommendations and workarounds efficiently to a variety of audiences, including diverse multi-cultural groups.
CLO 6	Synthesise and abstract mathematical concepts, artificial intelligence fundamentals and industry best practices to solve varied commercial problems.
CLO 7	Make independent judgements in varied software engineering contexts demonstrating a commitment to social justice and human rights.

Course Learning Outcome Code	Course Title: Master of Software Engineering (Artificial Intelligence) Course Learning Outcome Descriptor
CLO 1	Analyse and integrate cognitive and technical skills from the software engineering body of knowledge to tackle complex commercial software engineering problems with innovation and ethical practice.
CLO 2	Critically analyse problem sets to synthesise acute software engineering solutions and communicate recommendations, conclusions and professional decisions to both expert and novice audiences.
CLO 3	Master and synthesise cognitive, technical and creative skills from the field of artificial intelligence necessary to effectively & efficiently solve or investigate problem sets.
CLO 4	Demonstrate sound judgement, non-partisanship and accountability as part of leadership role in a team to achieve effective planning, management, execution and communication.
CLO 5	Communicate technical solutions, recommendations and workarounds efficiently to a variety of audiences, including diverse multi-cultural groups.
CLO 6	Synthesise and abstract mathematical concepts, artificial intelligence fundamentals and industry best practices to solve varied commercial problems.
CLO 7	Possess a comprehensive and in-depth knowledge of Artificial Intelligence principles and techniques that includes understanding of recent developments.
CLO 8	Research complex problem sets to advance the field of artificial intelligence including those at the intersection of health, transportation, manufacturing or finance.

Course Learning Outcome Code	Course Title: Master of Software Engineering (Artificial Intelligence, Advanced) Course Learning Outcome Descriptor
CLO 1	Analyse and integrate cognitive and technical skills from the software engineering body of knowledge to tackle complex commercial software engineering problems with innovation and ethical practice.
CLO 2	Critically analyse problem sets to synthesise acute software engineering solutions and communicate recommendations, conclusions and professional decisions to both expert and novice audiences.
CLO 3	Master and synthesise cognitive, technical and creative skills from the field of artificial intelligence necessary to effectively & efficiently solve or investigate problem sets.
CLO 4	Demonstrate sound judgement, non-partisanship and accountability as part of leadership role in a team to achieve effective planning, management, execution and communication.
CLO 5	Communicate technically to present coherent and sustained arguments and to disseminate research that makes a contribution to knowledge.
CLO 6	Synthesise and abstract mathematical concepts, artificial intelligence fundamentals and industry best practices to solve varied commercial problems.
CLO 7	Possess a comprehensive and in-depth knowledge of Artificial Intelligence principles and techniques that includes understanding of recent developments.
CLO 8	Research, critique and resolve complex problem sets in the field of artificial intelligence while evaluating broader contexts and multidisciplinary perspectives covering health, transportation, manufacturing, finance and related industries.

Course Learning Outcome Code	Course Title: Graduate Diploma of Software Engineering (Cloud Computing) Course Learning Outcome Descriptor
CLO 1	Analyse and integrate cognitive and technical skills from the software engineering body of knowledge to tackle complex commercial software engineering problems with innovation and ethical practice.
CLO 2	Critically analyse problem sets to synthesise acute software engineering solutions and communicate recommendations, conclusions and professional decisions to both expert and novice audiences.
CLO 3	Innovatively apply highly specialised and integrated software engineering knowledge to a diverse variety of technical problems including those related to emerging technologies.
CLO 4	Demonstrate sound judgement, non-partisanship and accountability as part of leadership role in a team to achieve effective planning, management, execution and communication.
CLO 5	Communicate technical solutions, recommendations and workarounds efficiently to a variety of audiences, including diverse multi-cultural groups.

CLO 6	Synthesise and abstract cloud computing concepts, devops basics and industry best practices to solve varied commercial problems.
CLO 7	Make independent judgements in varied software engineering contexts demonstrating a commitment to social justice and human rights.

Course Learning Outcome Code	Course Title: Master of Software Engineering (Cloud Computing) Course Learning Outcome Descriptor
CLO 1	Analyse and integrate cognitive and technical skills from the software engineering body of knowledge to tackle complex commercial software engineering problems with innovation and ethical practice.
CLO 2	Critically analyse problem sets to synthesise acute software engineering solutions and communicate recommendations, conclusions and professional decisions to both expert and novice audiences.
CLO 3	Master and synthesise cognitive, technical and creative skills from the field of cloud computing necessary to effectively & efficiently solve or investigate problem sets.
CLO 4	Demonstrate sound judgement, non-partisanship and accountability as part of leadership role in a team to achieve effective planning, management, execution and communication.
CLO 5	Communicate technical solutions, recommendations and workarounds efficiently to a variety of audiences, including diverse multi-cultural groups.
CLO 6	Synthesise and abstract Cloud Computing concepts, devops basics and industry best practices to solve varied commercial problems.
CLO 7	Possess a comprehensive and in-depth knowledge of Cloud Computing and tools that includes understanding of recent developments.
CLO 8	Research Cloud Computing challenges including diversity and ethical practice to generate appropriate strategic solutions.

Course Learning Outcome Code	Course Title: Master of Software Engineering (Cloud Computing, Advanced) Course Learning Outcome Descriptor
CLO 1	Analyse and integrate cognitive and technical skills from the software engineering body of knowledge to tackle complex commercial software engineering problems with innovation and ethical practice.
CLO 2	Critically analyse problem sets to synthesise acute software engineering solutions and communicate recommendations, conclusions and professional decisions to both expert and novice audiences.
CLO 3	Master and synthesise cognitive, technical and creative skills from the field of cloud computing necessary to effectively & efficiently solve or investigate problem sets.
CLO 4	Demonstrate sound judgement, non-partisanship and accountability as part of leadership role in a team to achieve effective planning, management, execution and communication.
CLO 5	Communicate technically to present coherent and sustained arguments and to disseminate research that makes a contribution to knowledge.

CLO 6	Synthesise and abstract Cloud Computing concepts, devops basics and industry best practices to solve varied commercial problems.
CLO 7	Possess a comprehensive and in-depth knowledge of Cloud Computing and tools that includes understanding of recent developments.
CLO 8	Research, appraise and apply different cloud computing methodologies with consideration towards socio-economic constraints, ethical practice & global sustainability of source material.