School of Information and Physical Sciences

SENG4001A: Software Engineering Final Year Project Part A

Callaghan

Semester 1 - 2024

COURSE OUTLINE

OVERVIEW

Course Description

This course is Part A of a multi-term sequence. Part B must also be completed in the same year to meet the requirements of the sequence. Software Engineering Final Year Projects represent the culmination of study towards the Bachelor of Software Engineering degree. Final year projects are undertaken with industry and offer the opportunity to apply and extend material learned throughout the program. Industry projects span a diverse range of topics and application areas with an emphasis on technical skills, project management, software engineering methodology, and communication. Through Part A and Part B you will work on an individual software engineering project that involves being embedded within an existing industry team environment. In your project (through Part A and Part B), you will undertake independent research that results in the production of a research report and the development of a software prototype that requires you to incorporate software engineering skills into your practice. Through Part A and Part B, 140 hours of Work Integrated Learning (WIL) activities must be completed and verified by the nominated project supervisor. Under your WIL requirements, these hours can be completed across a range of project-based activities and with an approved and relevant industry partner. Information will be provided by the Course Coordinator on the process for organising a Work Integrated Learning Experience for this course. The Course Coordinator will ensure that the experience is appropriate and does not adversely affect other existing activities or courses of the University. You will require a nominated supervisor within the industry partner organisation.

Academic Progress Requirements

Nil

Assumed Knowledge

For students to derive maximum value from this course and to ensure that the host organisation derive substantive benefits as well, it is essential that students have a satisfactory knowledge and skill base prior to WIL. Students therefore should have successfully completed at least 210 units of their program prior to enrolment in the course.

Contact Hours

Callaghan
Individual Supervision
Face to Face On Campus
0.5 hour(s) per fortnight for 6 fortnight(s) starting Week 1

Placement *
Face to Face Off Campus
140 hour(s) per term starting Week 1

Seminar
Face to Face On Campus

	2 hour(s) per week(s) for 12 week(s) starting Week 1
	* This contact type has a compulsory requirement.
Unit Weighting	10
Workload	Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.
Multi-Term Sequence Advice	This course is part of a multi-term sequence. Both Part A and Part B must be completed to meet the requirements of the sequence. Part A and Part B must be completed in consecutive terms. Students must complete Part A before completing Part B. Students must complete the sequence within a twelve month period. If students complete Part A but are unable to complete Part B within the timeframe, they must re-enrol in Part A. Part A cannot be completed as a standalone course, it will only count towards your program once you have successfully completed Part B.

CONTACTS

Course Coordinator

Callaghan
Dr Kyle Harrison
Kyle.Harrison@newcastle.edu.au
(02) 4055 0738
Consultation: by appointment.

Teaching Staff

Other teaching staff will be advised on the course Canvas site.

School Office

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SR233, Social Sciences Building
Callaghan
CESE-SIPS-Admin@newcastle.edu.au
+61 2 4921 5513
9am-5pm (Mon-Fri)

SYLLABUS

Course Content

The project will be conducted under the direct supervision of an industry supervisor and will be supported by appropriate academic staff. The specific project topic undertaken will reflect the common interests and expertise of the student(s) and supervisor. Through Parts A and Part B, students will be required to:

- Perform a literature review to identify and synthesise current knowledge and developments in the chosen technical area. This will also consider appropriate methods for testing and/or evaluation of solutions.
- Undertake detailed technical work in the chosen project area using one or more of theoretical studies, evaluations and/or computer simulations.
- Develop a fully functional software product or prototype applying appropriate software development methodology.
- Produce progress reports or maintain a professional journal to establish work completed, and to schedule work within the time frame specified for the project.
- Prepare a research report describing the work undertaken and results obtained.
- Prepare industry appropriate software documentation.
- Provide a formal presentation and demonstration of the project.
- Complete a Pre-WIL preparation module online.
- Complete 140 hours of WIL experience.

Course Learning Outcomes	**On successful completion of this course, students will be able to:** 1. Identify risks associated throughout the evolution of a software development project and develop strategies to overcome risks. 2. Apply theory and knowledge of software design, testing and validation to real-world software development projects. 3. Utilise time management skills in both a software engineering project and in the workplace. 4. Use professional oral and written communication skills in the preparation of software prototypes, demos and documentation to satisfy the standards of engineers and other software professionals. 5. Demonstrate professional and research skills in software engineering by locating, interpreting and applying technical information and standards. 6. Critically reflect on the ethical and technical issues faced in the workplace.

COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

Contact Hour Requirements:

- Placement Has compulsory attendance

Course Assessment Requirements:

- Assessment 5 - Interim Project Report and Reflection plus Supervisor Report: Pass requirement 40% - Must obtain 40% in this assessment item to pass the course.

Compulsory Placement and WHS Requirements:

- WHS Requirement - Students must complete a Workplace Safety Induction or Risk Assessment. Failure to complete the placement organisation WHS-Safety Induction and Risk Assessment will constitute a fail in this course. The organisation MAY offer an alternate time at their discretion though there is no obligation from them to do so.
- Placement - Completion of 140 hours of placement is a compulsory requirement. An 'Industry Placement – IP' grade will be awarded in the following circumstance:
  - All assessment items have been completed; and
  - Placement hours have not been completed.

ASSESSMENTS

This course has 5 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Project Plan and Requirements	Week 4 (Sunday)	Individual	20%	1, 2, 4, 6
2	Project Activity Log and Reflection	To be submitted periodically. See Canvas for further details.	Individual	10%	3, 4, 6
3	Requirements and Design Documents	Week 6 (Sunday)	Individual	20%	1, 2, 3, 4, 5, 6
4	Progress Presentation	Week 12 (During Seminar)	Individual	20%	1, 2, 3, 4, 5, 6
5	Interim Project Report and Reflection plus Supervisor Report*	Week 13 (Sunday)	Individual	30%	1, 2, 3, 4, 5, 6

* This assessment has a compulsory requirement.

Late Submissions The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for

that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Project Plan and Requirements

Assessment Type	Written Assignment
Purpose	Design a project plan and requirements document outlining the key milestones and technical requirements of the project.
Description	The individual project plan should encompass key components, including a literature review plan, task assignments, client meeting schedules, task completion plans, and organizational and logistic considerations, as applicable. This plan serves as a foundational tool to assess the individual's capacity for self-organization. It aids in evaluating personal communication skills at the project's outset, fostering the development of oral communication skills, and evolving the ability to articulate opinions clearly and professionally, both within the individual's work and when communicating with supervisors. Additionally, the documents to be delivered should provide a comprehensive description of the business requirements for the system to be developed, including prototypes.
Weighting	20%
Due Date	Week 4 (Sunday)
Submission Method	Online
Assessment Criteria	See assessment specification and marking forms on Canvas.
Return Method	Not Returned
Feedback Provided	Online
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 2 - Project Activity Log and Reflection

Assessment Type	Log / Workbook
Purpose	Maintain a project activity log and engage in reflective writing to discuss personal and professional growth through the project.
Description	This assessment item involves the maintenance of a detailed project activity log. You are expected to consistently update this log, providing a chronological account of daily or weekly activities related to the project. Log entries may include attendance at meetings, completion of development tasks, challenges and corresponding problem-solving efforts, milestones achieved, and the allocation of time to different project phases. Particularly, your project log should highlight the alignment of your activities to your project plan in the context of an appropriate software engineering methodology. Furthermore, this activity log should inform the discussions with your supervisor and should be used to provide data-driven adjustments to your project timeline. The activity log serves as an ongoing assessment component and should be regularly updated throughout the project. Complementing the activity log, you will engage in reflective practices that discuss your progress towards completion of the project. These reflective reports should delve into personal and professional growth experienced throughout the project, lessons derived from both challenges and successes, the practical application of theoretical knowledge, and the evolution of problem-solving skills. The reflective reports are intended to be thoughtful, showcasing critical thinking and self-awareness. Emphasis lies in the ability to connect project experiences with the theoretical knowledge acquired throughout the software engineering program, particularly around your ability to adapt the project plan and/or deliverables according to an introspective reflection of your progress in the context of a suitable project management methodology.
Weighting	10%
Due Date	To be submitted periodically. See Canvas for further details.
Submission Method	Online
Assessment Criteria	See assessment specification and marking forms on Canvas.
Return Method	Not Returned
Feedback Provided	Online
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 3 - Requirements and Design Documents

Assessment Type	Written Assignment
Purpose	Develop the software requirements and design documents associated with the project.
Description	The design document is a “written description of a software product that a software designer writes in order to give a software development team an overall guidance of the architecture of the software project”. The document serves as a crucial artifact, providing a detailed written description of the software product. Its primary purpose is to guide a software development team by offering a holistic view of the architecture and structure of the software project. This phase requires effective project planning and the development of a robust testing strategy within the design. Furthermore, you are required to showcase proficiency in using suitable modelling notations, such as Unified Modelling Language (UML), to articulate the software design cohesively.
Weighting	20%
Due Date	Week 6 (Sunday)
Submission Method	Online
Assessment Criteria	See assessment specification and marking forms on Canvas.
Return Method	Not Returned
Feedback Provided	Online
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 4 - Progress Presentation

Assessment Type	Presentation
Purpose	Provide a presentation of the student’s individual project.
Description	Students will deliver a concise and informative presentation lasting approximately 10 minutes, offering a comprehensive overview of the current project status. The objective is to provide a clear and detailed explanation of significant progress areas achieved thus far and articulate a well-defined path forward for addressing the upcoming project phases. It is imperative that the presentation and technical demonstration are executed in a professional manner. This involves clear communication, adherence to time constraints, and a polished presentation style. The primary aim of the presentation is to solicit valuable feedback from the project client and supervisor(s). This feedback is intended to evaluate the quality of the presentation, identify potential pitfalls in the description of system features, and offer constructive insights for improvement.
Weighting	20%
Due Date	Week 12 (During Seminar)
Submission Method	Online
Assessment Criteria	See assessment specification and marking forms on Canvas.
Return Method	Not Returned
Feedback Provided	Online
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 5 - Interim Project Report and Reflection plus Supervisor Report

Assessment Type	Written Assignment
Purpose	Produce a written report with an in-depth literature review of the research component.
Description	Students whose overall mark in the course is 50% or more, but who score less than 40% in the compulsory item and thus fail to demonstrate the required proficiency, will be awarded a Criterion Fail grade, which will show as FF on their formal transcript. However, students in this position who have scored at least 25% in the compulsory item will be allowed to undertake a supplementary 'capped' assessment in which they can score at most 50% of the possible mark for that item. The style of the Interim Report should follow that of a scholarly academic manuscript, ensuring a depth of analysis and critical engagement with the selected research field. Students are encouraged to adopt an academic tone, presenting a well-organized review that synthesizes existing knowledge and identifies research gaps.

	In addition to the literature review, students are required to integrate a reflective component within the interim report. This reflection should encompass personal insights gained during the literature review process, highlighting challenges encountered, methodological decisions made, and the evolving understanding of the research context. The reflective component serves as a valuable self-assessment tool, enabling students to articulate their intellectual journey and refine their research focus for the subsequent stages of the project. As a crucial part of the assignment, a signed report from the supervisor is required. This report provides valuable insights into the student's progress, the effectiveness of the literature review, and potential areas for improvement. The supervisor's evaluation adds an external perspective, enriching the assessment process and contributing to a more comprehensive understanding of the student's engagement with the project. A template for this report will be provided.
Weighting	30%
Compulsory Requirements	Pass requirement 40% - Must obtain 40% in this assessment item to pass the course..
Due Date	Week 13 (Sunday)
Submission Method	Online
Assessment Criteria	See assessment specification and marking forms on Canvas.
Return Method	Not Returned
Feedback Provided	Online
Opportunity to Reattempt	Students WILL be given the opportunity to reattempt this assessment.

ADDITIONAL INFORMATION

Grading Scheme

This course is Part A of a multi-term sequence. A grade will be awarded at the completion of Part B.

Placement Requirements

This is a placement course covered by the Student Placement Policy. Refer to http://newcastle.edu.au/policy/000768.html for further information.

Communication Methods

Communication methods used in this course include:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face to face meetings or supervision.

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the Oral Examination (viva) Procedure. In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the Student Conduct Rule.

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to https://policies.newcastle.edu.au/document/view-current.php?id=35.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:
https://policies.newcastle.edu.au/document/view-current.php?id=236

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures that support a safe and respectful environment at the University.

GRADUATE PROFILE STATEMENTS

The following table illustrates how this course contributes towards building the skills students will need to work in their profession.

Level of capability

- Level 1 indicates an introduction to a topic at a university level
- Levels 2 and 3 indicate progressive reinforcement of that topic
- Level 4 indicates skills commensurate with a graduate – entry to professional practice
- Level 5 indicates highly specialist or professional ability

	University of Newcastle Bachelor of Engineering Graduate Profile Statements	**Taught**	**Practised**	**Assessed**	**Level of capability**
	Knowledge Base				
1	1.1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.	X	X	X	2
2	1.2. Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.	X	X	X	2
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.	X	X	X	1
4	1.4. Discernment of knowledge development and research directions within the engineering discipline.	X	X	X	1
5	1.5. Knowledge of contextual factors impacting the engineering discipline.				

6	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.				
	Engineering Ability				
7	2.1. Application of established engineering methods to complex engineering problem solving.	X	X	X	1
8	2.2. Fluent application of engineering techniques, tools and resources.	X	X	X	1
9	2.3. Application of systematic engineering synthesis and design processes.	X	X	X	1
10	2.4. Application of systematic approaches to the conduct and management of engineering projects.				
	Professional Attributes				
11	3.1. Ethical conduct and professional accountability				
12	3.2. Effective oral and written communication in professional and lay domains.	X	X	X	1
13	3.3. Creative, innovative and pro-active demeanour.				
14	3.4. Professional use and management of information.				
15	3.5. Orderly management of self, and professional conduct.				
16	3.6. Effective team membership and team leadership.				

Bachelor of Engineering

This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.