

## ELEC4840A: Final Year Engineering Project Part A

Callaghan

Semester 1 - 2023



THE UNIVERSITY OF  
NEWCASTLE  
AUSTRALIA

## OVERVIEW

### Course Description

Final Year Projects represent the culmination of study towards the Bachelor of Engineering degree. Projects offer the opportunity to apply and extend material learned throughout the program. Assessment is by means of a seminar presentation, submission of a thesis, and a public demonstration of work undertaken.

In contrast to the majority of courses studied elsewhere in the program, projects are undertaken individually or in small groups. This necessarily introduces the dimension of workload management into the program to enable completion of a large, relatively unstructured "assignment" over the course of the year.

The projects undertaken span a diverse range of topics, including theoretical, simulation and experimental studies, and vary from year to year. The emphasis is necessarily on facilitating student learning in technical, project management and presentation spheres.

### Assumed Knowledge

Students must have successfully completed a minimum of 210 units to enrol in this course.

3rd year of Electrical, Computer, Telecommunications or Mechatronics Engineering degree

### Contact Hours

#### Lecture

Face to Face On Campus

1 hour(s) per Week for Full Term

Plus regular meetings with designated supervisor.

### Unit Weighting Workload

10

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.

# COURSE OUTLINE

[www.newcastle.edu.au](http://www.newcastle.edu.au)

CRICOS Provider 00109J

# CONTACTS

<b>Course Coordinator</b>	<b>Callaghan</b> Dr Behnam Akhavan Behnam.Akhavan@newcastle.edu.au (02) 4033 9246 Consultation: Tuesday 2 pm to 3 pm
<b>Teaching Staff</b>	Other teaching staff will be advised on the course Canvas site.
<b>School Office</b>	<b>School of Engineering</b> EAG03 EA Building Callaghan +61 2 4921 5798 9.00am-1.00pm and 2.00pm-5.00pm (Monday to Friday)

# SYLLABUS

<b>Course Content</b>	<p>This course will be conducted largely as an individual or small group project under the direct supervision of a member of academic staff. The specific project topic undertaken will reflect the common interests and expertise of the student(s) and supervisor. Students will be required to:</p> <ol style="list-style-type: none"><li>1. Perform a literature search to review current knowledge and developments in the chosen technical area;</li><li>2. Undertake detailed technical work in the chosen area using one or more of: theoretical studies, computer simulations, hardware construction;</li><li>3. Produce progress reports or maintain a professional journal to establish work completed, and to schedule additional work within the time frame specified for the project;</li><li>4. Deliver a seminar on the general area of work being undertaken and specific contributions to that field;</li><li>5. Prepare a formal report describing the work undertaken and results obtained so far.</li></ol>
<b>Course Learning Outcomes</b>	<p><b>On successful completion of this course, students will be able to:</b></p> <ol style="list-style-type: none"><li>1. Demonstrate a sound technical knowledge of their selected project topic.</li><li>2. Undertake problem identification, formulation and solution.</li><li>3. Design engineering solutions to complex problems utilising a systems approach.</li><li>4. Conduct an engineering project.</li><li>5. Communicate with engineers and the community at large in written and oral forms.</li><li>6. Demonstrate the knowledge, skills and attitudes of a professional engineer.</li></ol>
<b>Course Materials</b>	<p><b>Recommended Text:</b></p> <ul style="list-style-type: none"><li>- D Beer and D McMurrey "A Guide to Writing as an Engineer" John Wiley and Sons 2014 (808.0666 BEER 2014)</li><li>- J Hooke and J Philips "Getting Your Message Across: The Seven Steps to Communicating Successfully in Every Situation" Simon and Schuster 1996 (808.5 HOOK)</li><li>- J Summers and B Smith "Communications Skills Handbook" John Wiley and Sons 2014 (658.45 SUMM 2014)</li><li>- AR Eide, RD Jenison, LA Mashaw and LL Northup "Introduction to Engineering Design" McGraw Hill 1998 (62.0042 EIDE)</li><li>- T Klastorin "Project Management: Tools and Tradeoffs" John Wiley and Sons 2004 (658.404 KLAS)</li></ul>

# COMPULSORY REQUIREMENTS

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

## Contact Hour Requirements:

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## Course Assessment Requirements:

- Assessment 1 - Project: Pass Requirement - Students must pass this assessment item to pass the course. Assessment 1 - WH&S Requirements - Students must satisfactorily attempt/submit this assessment item to pass the course. Students are not permitted to progress to ELEC4840B without satisfactorily assessing and identifying the risks associated with their project.
- Assessment 2 - Report: Pass Requirement - Students must pass this assessment item to pass the course. Assessment 2 - Interim Report - Students must pass this assessment item to pass the course. Students must pass this assessment item to progress to ELEC4840B .
- Assessment 3 - Presentation: Pass Requirement - Students must pass this assessment item to pass the course. Assessment 3 - Seminar Presentation - Students must pass this assessment item to pass the course. Students must pass this assessment item to progress to ELEC4840B .

## Pre-Placement Requirements:

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# ASSESSMENTS

This course has 3 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	WH&S Requirements*	Lab induction: Week 3, Friday Lab access quiz: Week 3, Friday Risk assessment: Week 4, Friday	Individual	Formative	4, 6
2	Interim Report*	Friday, Week 13	Individual	Formative	1, 2, 3, 4, 5, 6
3	Seminar Presentation*	To be announced on Canvas.	Individual	Formative	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 - WH&S Requirements

### Assessment Type Description

Project

The School and University have developed policies and procedures to comply with legislative requirements for workplace health and safety in laboratories. Students must demonstrate awareness of and compliance with all relevant aspects. Students are required to complete a lab induction, lab access quiz and risk assessment relevant to their project by the dates published in the course outline. Students that do not complete their WH&S requirements by the required dates will not be passed.

<b>Weighting</b>	This is a formative assessment and will not contribute to your final grade.
<b>Compulsory Requirements</b>	Pass Requirement - Students must pass this assessment item to pass the course..
<b>Due Date</b>	Lab induction: Week 3, Friday Lab access quiz: Week 3, Friday Risk assessment: Week 4, Friday
<b>Submission Method</b>	Online Risk assessment should be submitted via the CESE WHS Canvas site.
<b>Assessment Criteria</b>	The lab induction and access quiz are completed online. They are accessed through the "Lab Induction and Access Quizzes" on the CESE WHS Canvas site.
<b>Return Method</b>	Not Returned
<b>Feedback Provided</b>	In Person - . Students should consult with their supervisor in the preparation of their project risk assessment.
<b>Opportunity to Reattempt</b>	Students WILL be given the opportunity to reattempt this assessment. Students WILL be given the opportunity to reattempt this assessment by a specified date should their initial performance be deemed unsatisfactory.

## Assessment 2 - Interim Report

<b>Assessment Type</b>	Report
<b>Description</b>	A formal report describing the scope and direction of the project, relevant background material pertinent to the project, literature review, work completed to date and detailed plan of work to follow. This report is seen as the foundation of your final report.  For group projects, individual students are required to write their own interim report. It may contain a similar introductory chapter and should refer to how the other group member's work interconnects with their work. Students are required to achieve a pass mark in their interim report or they are unable to proceed to part B of their project.
<b>Weighting</b>	This is a formative assessment and will not contribute to your final grade.
<b>Compulsory Requirements</b>	Pass Requirement - Students must pass this assessment item to pass the course..
<b>Due Date</b>	Friday, Week 13
<b>Submission Method</b>	Online Students are required to ONLY submit an electronic copy of their report via Canvas.
<b>Assessment Criteria</b>	Available on Canvas.
<b>Return Method</b>	In Person
<b>Feedback Provided</b>	Returned Work - . Marking sheets will be made available for viewing from the supervisor or course coordinator.
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment. Students WILL NOT be given the opportunity to reattempt this assessment. A mark less than 50% indicates the student has either inadequate knowledge or progress to be able to satisfactorily complete their project in ELEC4840B. There is no opportunity to re-submit an interim report (except in the case of adverse circumstances) as the report represents the culmination of a semester / trimesters work. Substantial work would be required to rectify a project where inadequate progress is made. Students have regular meetings with their supervisors during the semester to provide feedback on their progress.

## Assessment 3 - Seminar Presentation

<b>Assessment Type</b>	Presentation
<b>Description</b>	A fifteen minute public seminar presentation (followed by five minutes questions).
<b>Weighting</b>	This is a formative assessment and will not contribute to your final grade.
<b>Compulsory Requirements</b>	Pass Requirement - Students must pass this assessment item to pass the course..
<b>Due Date</b>	To be announced on Canvas.
<b>Submission Method</b>	In Class
<b>Assessment Criteria</b>	Available on Canvas.
<b>Return Method</b>	In Person
<b>Feedback Provided</b>	Returned Work - . Seminar Presentation marking sheets will be made available for viewing

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<b>Opportunity to Reattempt</b>	from the supervisor or course coordinator. Students WILL be given the opportunity to reattempt this assessment. Students WILL be given the opportunity to reattempt this assessment should their initial performance be deemed unsatisfactory.
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## ADDITIONAL INFORMATION

<b>Grading Scheme</b>	This course is Part A of a multi-term sequence. A grade will be awarded at the completion of Part B.
<b>WH&amp;S Requirements</b>	The School and University have developed policies and procedures to comply with legislative requirements for workplace health and safety in laboratories. Students must demonstrate awareness of and compliance with all relevant aspects. Students are required to complete a lab induction, lab access quiz and risk assessment relevant to their project by the dates published in the course outline. Students that do not complete their WH&S requirements by the required dates will not be passed.
<b>Communication Methods</b>	Communication methods used in this course include: <ul style="list-style-type: none"><li>- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.</li><li>- Email: Students will receive communications via their student email account.</li><li>- Face to Face: Communication will be provided via face to face meetings or supervision.</li></ul>
<b>Course Evaluation</b>	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.
<b>Oral Interviews (Vivas)</b>	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 <a href="#">Oral Examination (viva) Procedure</a> . 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 <a href="#">Student Conduct Rule</a> .
<b>Academic Misconduct</b>	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 <a href="https://policies.newcastle.edu.au/document/view-current.php?id=35">https://policies.newcastle.edu.au/document/view-current.php?id=35</a> .
<b>Adverse Circumstances</b>	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: <ol style="list-style-type: none"><li>1. the assessment item is a major assessment item; or</li><li>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;</li><li>3. you are requesting a change of placement; or</li><li>4. the course has a compulsory attendance requirement.</li></ol> Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at: <a href="https://policies.newcastle.edu.au/document/view-current.php?id=236">https://policies.newcastle.edu.au/document/view-current.php?id=236</a>
<b>Important Policy Information</b>	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 <a href="https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures">https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures</a> that support a safe and respectful environment at the University.

*This course outline was approved by the Head of School 3/02/2023. 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. © 2023 The University of Newcastle, Australia*

## Graduate Profile Statements

This course builds students' capacity in the following University of Newcastle Bachelor of Engineering Graduate Profile Statements (based on 2011 Engineers Australia revised Stage 1 Competency Standards for Professional Engineers):

UON Att.	University of Newcastle Bachelor of Engineering Graduate Profile Statements/ Engineers Australia Stage 1 competency statements	Taught	Practised	Assessed	Skill Level (1-4)
	<b>Professional Attributes</b>				
11	3.1. Ethical conduct and professional accountability		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
12	3.2. Effective oral and written communication in professional and lay domains.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
13	3.3. Creative, innovative and pro-active demeanour.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
14	3.4. Professional use and management of information.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
15	3.5. Orderly management of self, and professional conduct.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
16	3.6. Effective team membership and team leadership.				
	<b>Engineering Ability</b>				
7	2.1. Application of established engineering methods to complex engineering problem solving.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
8	2.2. Fluent application of engineering techniques, tools and resources.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
9	2.3. Application of systematic engineering synthesis and design processes.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
10	2.4. Application of systematic approaches to the conduct and management of engineering projects.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
	<b>Knowledge Base</b>				
1	1.1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
2	1.2. Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
4	1.4. Discernment of knowledge development and research directions within the engineering discipline.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
5	1.5. Knowledge of contextual factors impacting the engineering discipline.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
6	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4