

## ELEC4840B: Final Year Engineering Project Part B

Callaghan

Semester 2 - 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 presentation 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

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

20

### 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.

# 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: Wednesday 2.00 pm – 3.00 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, and 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. Prepare a formal report describing the work undertaken and results obtained so far; and</li><li>5. Present the work in a forum involving poster presentations and demonstrations of operational hardware and software.</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>

## Course Materials

### Recommended Text:

- D Beer and D McMurrey "A Guide to Writing as an Engineer" John Wiley and Sons 2014 (808.0666 BEER 2014)
- 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)
- J Summers and B Smith "Communications Skills Handbook" John Wiley and Sons 2014 (658.45 SUMM 2014)
- AR Eide, RD Jenison, LA Mashaw and LL Northup "Introduction to Engineering Design" McGraw Hill 1998 (620.0042 EIDE)
- T Klasterin "Project Management Tools and Tradeoffs" John Wiley and Sons 2004 (658.404 KLAS)

# ASSESSMENTS

This course has 2 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Project Demonstration	To be announced on Canvas.	Individual	50%	1, 2, 3, 4, 5, 6
2	Final Report	Friday, Week 13	Individual	50%	1, 2, 3, 4, 5, 6

## 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 Demonstration

### Assessment Type Description

Presentation

Students are required to demonstrate their project outcomes to an examination panel. Questions will be directed at but not limited to: establishing the scope and direction of the project, ensuring that the relevant background material pertinent to the project is understood, establishing what the work completed is and information related to the difficulties faced in the project and management of the project.

### Weighting

50%

### Due Date

To be announced on Canvas.

### Submission Method

In Class

### Assessment Criteria

Available on Canvas.

### Return Method

Not Returned

### Feedback Provided

In Person - Students should consult with their academic supervisor in the first instance for feedback on their performance.

## Assessment 2 - Final Report

<b>Assessment Type</b>	Report
<b>Description</b>	<p>A formal report detailing the scope and direction of the project, relevant background material pertinent to the project and work completed within the project.</p> <p>For group projects individual group members are required to write their own final report. It may contain similar introductory chapter and should refer to how the other group members work interconnects with their work.</p> <p>It is mandatory that students include an "Assessment Item Coversheet" as part of the report and a "List of Contributions" page. A contributions page is a list of outcomes and achievements made as a result of your work in the project.</p>
<b>Weighting</b>	50%
<b>Due Date</b>	Friday, Week 13
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Students are required to ONLY submit an electronic copy of their report on Canvas.
<b>Return Method</b>	Available on Canvas.
<b>Feedback Provided</b>	Not Returned
	In Person - . Students should consult with their academic supervisor in the first instance for feedback on their performance.

## ADDITIONAL INFORMATION

### Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

\*Skills are those identified for the purposes of assessment task(s).

### WH&S Requirements

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 on 28.06.2023. 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.*

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## Graduate Profile Statements – ELEC4840B – Semester 2 2023

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