

MATS6800A: Advanced Materials Research A

Callaghan

Semester 1 - 2024



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

Welcome to Advanced Materials Research A Course

OVERVIEW

Course Description	The research project prepares students to independently conduct and report on a materials science research project of their chosen interest. The research project is aimed at developing skills in quantitative research and reporting research findings (empirical work), drawing implications and conclusions. The core structure of this research project focuses on the application of nanomaterials in the energy and environmental fields. The outcome of the research project will exhibit an original investigation, analysis, and interpretation of the obtained results.
Academic Progress Requirements	Nil
Assumed Knowledge	Completion of Year 1 of Masters of Material Science and Engineering
Contact Hours	Callaghan Individual Supervision Face to Face On Campus 2 hour(s) per week(s) for 13 week(s) starting Week 1 Seminar Face to Face On Campus 1 hour(s) per week(s) for 13 week(s) starting Week 1
Unit Weighting Workload	40 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

CONTACTS

Course Callaghan
Coordinator Prof Ajayan Vinu
Ajayan.Vinu@newcastle.edu.au
(02) 4921 8669
Consultation: Consultation by appointment

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

School Office **School of Engineering**
EAG03
EA Building
Callaghan
SENG-Admin@newcastle.edu.au
9.00am-1.00pm and 2.00pm-5.00pm (Monday to Friday)

SYLLABUS

Course Content

1. Introduction to research and the research process
2. Research ethics and integrity
3. Critical appraisal of the literature
4. Introduction to quantitative research, study designs and methods
5. Analysis and interpretation of quantitative data
6. Critical appraisal of quantitative research

Course Learning Outcomes

On successful completion of this course, students will be able to:

1. Identify and define novel research question in the area of material science and engineering
2. Write a literature review based on the identified research topic and evaluate literature to justify the research question
3. Select and justify appropriate research design and methods to address a specific research question and acknowledge the ethical implications of the research
4. Develop a research proposal as the basis for a thesis
5. Present and defend a research proposal

Course Materials

Recommended Reading:

- https://www.newcastle.edu.au/__data/assets/pdf_file/0010/827731/Writing-the-Reseach-Proposal-for-Confirmation.pdf
- Paltridge & Starfield (2007), Thesis and dissertation writing in a second language, p. 61.
- Krathwohl, D.R. (1988) (3rd ed.) How to prepare a research proposal. Guidelines for funding and dissertations in the social and behavioural sciences. Syracuse, New York: Syracuse University Press

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	Part A - Research Proposal and Presentation	17/06/2024	Individual	Formative	1, 2, 3, 4, 5
2	Part B - Thesis Dissertation		Individual	90%	1, 2, 3, 4
3	Part B - Oral Defence		Individual	10%	2, 3, 5

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 - Part A - Research Proposal and Presentation

Assessment Type Proposal / Plan
Purpose To assess the writing skills and understanding of project
 Writing a literature review and proposing a design for the project
Description Writing a literature review and proposing a design for the project.
 This is a formative assessment and will not contribute to your final grade. Final grade will be given at the end of Part B of the Course, Advanced Materials Research B
Weighting
Length 15-30 pages
Due Date 17/06/2024
Submission Method Online
Assessment Criteria This will be distributed in class
Return Method
Feedback Provided
Opportunity to Reattempt Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 2 - Part B - Thesis Dissertation

Assessment Type Thesis
Description
Weighting 90%
Due Date
Submission Method
Assessment Criteria
Return Method
Feedback Provided
Opportunity to Reattempt Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 3 - Part B - Oral Defence

Assessment Type Presentation
Description
Weighting 10%
Due Date
Submission Method
Assessment Criteria
Return Method
Feedback Provided

Opportunity to Reattempt Students WILL NOT 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.

Communication Methods

Communication methods used in this course include:

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

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)
	Professional Attributes				
11	3.1. Ethical conduct and professional accountability	0			3
12	3.2. Effective oral and written communication in professional and lay domains.	0			3
13	3.3. Creative, innovative and pro-active demeanour.	0			4
14	3.4. Professional use and management of information.		0		3
15	3.5. Orderly management of self, and professional conduct.	0			3
16	3.6. Effective team membership and team leadership.	0			4
	Engineering Ability				
7	2.1. Application of established engineering methods to complex engineering problem solving.	0	0		3
8	2.2. Fluent application of engineering techniques, tools and resources.	0	0		3
9	2.3. Application of systematic engineering synthesis and design processes.		0		3
10	2.4. Application of systematic approaches to the conduct and management of engineering projects.	0			3
	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.	0		0	3
2	1.2. Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.			0	3
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.		0		3
4	1.4. Discernment of knowledge development and research directions within the engineering discipline.	0			3
5	1.5. Knowledge of contextual factors impacting the engineering discipline.	0		0	3
6	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.	0		0	4

This course outline was approved 1/02/2024 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.

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