Course Outline

MATS6114/6113

Research Project A/Research Project

Materials Science and Engineering

2022 Term 1 Entry Point

2. Course information

Units of credit: 24 units over 3 terms. MATS6114 (6 UoC) runs twice (Stages I and II) over 2 semesters, and MATS6113 (12 UOC Stage III) runs in the 3rd semester after the completion of MATS6114.

Entry Point: Term 1, 2022

Pre-requisite: Students are required to finish at least 2 term study before taking the subject

Teaching times and locations: This course is conducted through a self-directed study, there are no formal lectures (apart from course introduction session) for this course.

2.1 Course summary

This course is designed for students undertaking Master of Material Technology (MMT) coursework program. It is based on the performance of an original research project, and students need to demonstrate competency in the design and execution of a research investigation.

A self-directed experimental research or design-based project to apply, contextualise, and integrate fundamental scientific/engineering concepts learnt throughout the Materials Science and Engineering undergraduate program. Students will develop advanced disciplinary knowledge and will apply this to problem solving in the chosen topic area. Students will develop and practice high-level skills in critical thinking, project management, safety consideration and risk management, data collection and analysis, problem solving, and technical communication.

Note: study arrangements and attendance for this course is made on a case-by-case basis and all enrolments must be processed by the Materials Science & Engineering School Office only. Please contact enquiries@materials.unsw.edu.au.

2.2 Course aims

To provide research training and advanced disciplinary knowledge. Students will understand how to understand a research questions, identify project aims, perform experimental investigations and analyse and interpret data. The aim of the course is to provide students with structured opportunity to undertake a self-directed and substantial experimental research or design-based project to:

Apply, contextualise, and integrate fundamental scientific/engineering concepts learnt throughout the program;

Develop advanced disciplinary knowledge and to apply this to problem solving in the discipline;

Develop and practice high-level skills in critical thinking, project management, safety consideration and risk management, data collection and analysis, problem solving, and professional/technical communication; and,

Gain experience in the use of standard and specialised practical techniques relevant to their chosen area.

1. Understand and apply advanced concepts and knowledge to solve problems

2.4 Relationship between course and progrolve problems

4. Course schedule and structure

This course consists of no formal class contact hours. When enrolled in MATS6114 you are expected to allocate 150 hours over each Term to complete all milestones and assessment tasks. When enrolled in MATS6113 you are expected to allocate 300 hours of your time over the Term. The table below lists the areas students should be focusing on throughout the year.

	MATS6114 ï Stage I (2022 Term 1)	
Week	**Topics/Tasks**	**Activity**

5. Assessment

5.1 Assessment tasks

Assessment task	Description	Weight	Due date
Project Management Plan	Students are required to submit a PMP covering the key elements of the project (see requirements below)	10%	2022 T1 Week 5
Literature Review	Students will submit a literature review of their project topic. Students would need to be able to demonstrate competency in understanding the research project and be able to clearly identify the research questions that they seek to investigate.	0%*	2022 T1 Week 10
Progress report on methodology and preliminary results	As part of the thesis writing process students need to submit a report detailing the work completed so far. The report should contain a section of the methodology and the preliminary results. The report should also include any issues that have arisen through the project that may affect the final submission of their thesis.	0%*	2022 T2 Week 10
Thesis Submission	The thesis is the major piece of work submitted at the end of the 24 UOC research project. A thesis at this level typically is 60 pages. It is marked by three nominated academic assessors using a standardised rubric for all theses.	90%	2022 T3 Week 10

***Note: Students are required to submit these assessment tasks throughout the thesis to obtain feedback from their supervisors and meet the milestones for progression in the course. The sections will be given a final grade upon marking of the completed thesis at the end of the course.**

Further information

UNSW grading system: https://student.unsw.edu.au/grades

UNSW assessment policy: https://student.unsw.edu.au/assessment

5.2 Assessment criteria and standards

Along with the assessment tasks listed in the table above there are a number of activities that students are required to complete in order to be able to progress through the research project. All assessment and tasks are explained below.

1. **Laboratory Safety Training Course**

Due: Week 2 or 3 – time to be advised

Location: **Teams Online**

Details: Students are required first to attend the Laboratory Safety Training Course. Students who do not attend this course will be forbidden to start experimental work until appropriate safety training is completed – this may result in significant delay in commencing experimental work.

2. **Project Management Plan**

Due: 5:00 pm Friday Week 5 Term 1 2022

Submission: Upload to the Moodle course site.

Coversheet: Coversheet (downloadable from the Moodle course site) must accompany the submitted plan, which must be signed by the academic supervisor to the effect that the plan is reasonable in terms of academic scope as well as the available time and resources.

Late Penalty: Work submitted after the deadline will attract a penalty.

Marking: Marked by the course coordinator.

Details: The aim of this assignment is to develop a project management plan for the Project. The plan should include the following:

1. General Outline including:
    a. Description of the project to be undertaken
    b. General scope and aims of the project
    c. Critical personnel
2. Project Planning
3. Budgeting and Cost Estimation
4. Scheduling
5. Resource Allocation (including inventory & status of all equipment)
6. Monitoring and Project Control
7. Project Auditing
8. Project Termination

Length: Maximum 6 A4 pages (including references)

Coursework: Project Management is taught in MATS6004 Management (core course). For students who have not done this course, relevant lecture notes are posted on the Moodle course site to assist in the formulation of the project management plan.

3. **Introduction and Literature Survey**

Due: 5:00 pm, Friday Week 10 Term 1 2022

Submission: Upload to the Moodle course site

Late Penalty: Work submitted after the deadline will attract a penalty of 2 marks of the total mark per day (or part thereof) late.

Details: Students must submit one copy of the completed Introduction and Literature Review thesis chapters. In particular, the Literature Review is to be properly written and referenced. Students are strongly advised to submit any drafts of these chapters to their supervisor beforehand in order to give the supervisor time to provide feedback and to return the work. The report will not be marked but kept as a record showing the students' progress.

Refer below for details concerning requests for extensions to the deadline.

4. Risk Assessment of Experimental Work

Due: No set date but must be completed and approved PRIOR TO ANY experimental work is commenced.

Submission: Hand-in hard copy to academic supervisors.

Details: A detailed risk assessment of all experimental work is required BEFORE ANY EXPERIMENTAL WORK IS DONE. Students are strongly urged to consult with their supervisor when completing the Risk Assessment. A new Risk Assessment is required for any later experimental work not covered in the original Risk Assessment. The Risk Assessment form is available in electronic form from the school website.

FAILURE TO COMPLETE A RISK ASSESSMENT PRIOR TO UNDERTAKING

Further information about academic integrity and **plagiarism** can be located at:

The *Current Students* site https://student.unsw.edu.au/plagiarism**,** and

The *ELISE* training site http://subjectguides.library.unsw.edu.au/elise/presenting

The *Conduct and Integrity Unit* provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct.

7. Readings and resources

There are no recommended reading or resources for this course, your supervisor may recommend texts that relate to your project.

8. Administrative matters

School Office: Room 137, Building E10 School of Materials Science and Engineering
School Website: http://www.materials.unsw.edu.au/
Faculty Office: Robert Webster Building, Room 128
Faculty Website: http://www.science.unsw.edu.au/

9. Additional support for students

The Current Students Gateway: https://student.unsw.edu.au/

Academic Skills and Support: https://student.unsw.edu.au/academic-skills

Student Wellbeing, Health and Safety: https://student.unsw.edu.au/wellbeing

Disability Support Services: https://student.unsw.edu.au/disability-services

Chapter 3 Methodology and Procedure (5 pages max)

This section should begin by presenting an experimental/numerical plan that will answer the questions raised in the Literature Survey and, hence, achieve the project aims. A working Plan is a very important part of the thesis, although it is usually rather brief.

A brief but concise description of the methods and procedure should then be presented. The procedure should be descriptive to the point that another trained scientist or engineer would be able to repeat the work. It must clearly state the analytical methods used (a theoretical background of the analytical methods is not necessary). It must also specify the variables, which are being explored and state over what range of values.

Chapter 4. Results and Analysis (2000-2500 words, 10 pages max)

This chapter should be brief but complete. Logical organisation is important to achieve brevity. Appropriate use of graphs and/or tables is important to achieve condensation. The use of correct units, scales, magnifications and the specification of errors are essential.

Chapter 5. Discussion (2500-3000 words, 15 pages max)

This chapter is of crucial importance and much of the intellectual content of the thesis will be found within it. The results will have to be interpreted, that is, reasons for the observed behaviour, patterns, correlations, etc. must be advanced and evaluated. Such interpretation will commonly require the use of the information or data presented in the literature survey. If possible, predictions should be made on the basis of any models advanced.

The Discussion must place the results within the context of information summarised in the literature review. Most importantly, the findings must be used in answering the questions posed by the project, that is, in achieving the project aims.

To meet the various requirements, a good discussion will lead in a logical way to the conclusions with which the thesis will end.

Chapter 6. Summary and Conclusions (2 pages max)

This Chapter should be no more than four pages in length. It should summarise both the results and their ramifications. This section represents a brief overview of the findings and their significance.

References

This section lists full citations of literature references used in the thesis. References should use 10 pt fonts. It is recommended that Endnote (free for UNSW students) is used to manage the reference.

Note: Students should submit any drafts of work for assessment to their supervisors at least one week before the deadline so the supervisors have time to read, correct, and return the work.

Marking Sheet MATS6114/MATS6113 (24 UOC)

Student: _____

Thesis Title: _____

Examiner: _____ Signature: _____

Adj. Mark

Abstract, Thesis Format and Presentation

1.	Quality of Abstract		/10	
2.	English expression and spelling		/10	
3.	Thesis formatting & general impression		/10	
		Mark:	/30	**/15**

Introduction and Literature Review

1.	Level of presentation, extent and relevance		/10	
2.	Critical assessment of the literature		/10	
3.	Referencing		/10	
4.	Establishment of project aims		/10	
		Mark:	/40	**/20**

Methodology and Procedure r

1.	Completeness and clarity of experimental outline		/15	**/15**

Results/Work Effort

1.	Amount of experimental work done		/10	
2.	Completeness of study		/10	
3.	Quality, logic and organisation of experiments		/10	
4.	Use of graphs, figures and tables to summarise results		/10	
		Mark:	/40	**/20**

Discussion and Conclusions

2.	Interpretation of results and sophistication of analysis		/10	
3.	Handling and identification of errors		/10	
4.	Comparison with other data		/10	
5.	Achievements with respect to project aims		/10	
		Mark:	/40	**/20**

TOTAL MARK: **/90**

The completed thesis (90%) is marked by three (3) independent examiners in the School. All feedback and discussion concerning the marked wor1i4the mahdling and identification of