



UNSW Course Outline

MATS1110 Introduction to Materials for Engineering Applications - 2024

Published on the 25 Aug 2024

General Course Information

Course Code : MATS1110

Year : 2024

Term : Term 3

Teaching Period : T3

Is a multi-term course? : No

Faculty : Faculty of Science

Academic Unit : School of Materials Science & Engineering

Delivery Mode : In Person

Delivery Format : Standard

Delivery Location : Kensington

Campus : Sydney

Study Level : Undergraduate

Units of Credit : 6

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

This course introduces Engineering students to the field of Materials Science and Engineering.

Throughout society, different materials are chosen for various applications. How and why given materials are selected, is a key step in the Engineering process. In this course, students will learn about the different classifications of materials, how their atomic structure and processing leads to the desirable properties needed for industry. Laboratory work will be used to examine the testing techniques employed by materials engineers to determine the properties and which processes are best suited for a given material. Students will be challenged to select the correct material for a real-world problem through their understanding of mechanical, chemical and structural properties of materials. The delivery of course content is through a combination of lectures, tutorials, laboratories and project work. No prior science knowledge is required to undertake this course.

Course Aims

The aim of this course is to introduce students to the field of Material Science and Engineering with a particular emphasis on the use of different materials in Engineering applications. Through lectures, tutorials and laboratory classes, this course will also provide a solid background of how a materials multi-length-scale structure and processing history leads to the desirable properties needed for a given application. Materials classification and selection for a given application will be a core emphasis and delivered using lecture and project-based learning.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Describe the relationships between a materials multi-length-scale structure and its mechanical and functional properties.
CLO2 : Classify materials into general groups of metals, ceramics, polymers and composites.
CLO3 : Apply materials testing methods to investigate and quantify material properties.
CLO4 : Apply communication and problem solving skills to identify ideal materials for design applications.

Course Learning Outcomes	Assessment Item
CLO1 : Describe the relationships between a materials multi-length-scale structure and its mechanical and functional properties.	<ul style="list-style-type: none">• Laboratory reports• Online Tutorial Quiz• Final exam
CLO2 : Classify materials into general groups of metals, ceramics, polymers and composites.	<ul style="list-style-type: none">• Online Tutorial Quiz• Final exam
CLO3 : Apply materials testing methods to investigate and quantify material properties.	<ul style="list-style-type: none">• Laboratory reports
CLO4 : Apply communication and problem solving skills to identify ideal materials for design applications.	<ul style="list-style-type: none">• Group Project on Materials Selection

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Laboratory reports Assessment Format: Individual	25%	
Online Tutorial Quiz Assessment Format: Individual	10%	
Group Project on Materials Selection Assessment Format: Group	25%	Start Date: Not Applicable
Final exam Assessment Format: Individual	40%	

Assessment Details

Laboratory reports

Assessment Overview

There will be 4 laboratories throughout the course on:

Tensile Testing, Fracture, Corrosion and Batteries, Steel Microstructures.

To complete the assessment task, you will be required to complete a lab sheet of data acquisition and recording as well as several questions in order to demonstrate your ability in performing experimental investigations.

The lab report will be due 1 week after each lab.

Feedback: You will receive your mark for lab reports within 2 weeks of submission with a comment detailing the areas that require further understanding.

Course Learning Outcomes

- CL01 : Describe the relationships between a materials multi-length-scale structure and its mechanical and functional properties.
- CL03 : Apply materials testing methods to investigate and quantify material properties.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.

If your Convenor has concerns that your submission contains passages of AI-generated text or media, you may be asked to account for your work. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.

For more information on Generative AI and permitted use please see [here](#).

Online Tutorial Quiz

Assessment Overview

During the term you will conduct five online quizzes relating to the course content. The quizzes are aligned with the lecture and tutorial content and will occur between weeks 2 and 10.

Each quiz will contribute 2% to your final grade.

The intention of these tests is to continually check and reinforce key materials concepts as the course content develops.

The structure of each test will be as a series of multiple choice and calculation questions testing knowledge of a specific concept. You will have one attempt at each question. Once started, each quiz will be open for 30 minutes for you to complete.

Course Learning Outcomes

- CL01 : Describe the relationships between a materials multi-length-scale structure and its mechanical and functional properties.
- CL02 : Classify materials into general groups of metals, ceramics, polymers and composites.

Assignment submission Turnitin type

Not Applicable

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.

For more information on Generative AI and permitted use please see [here](#).

Group Project on Materials Selection

Assessment Overview

This is a team task in which you are to perform the job of a Materials Engineer when faced with a product design in which the selection of the materials is not yet made.

You will be randomly allocated into groups during week 2. We will let you know as soon as they are formed so you can contact your group member via Moodle. The lecture times during Week 3 are reserved for you and your group to meet and get a start on the project work.

The group project has two submissions.

Submission 1 is a report on your materials selection process within the **Weighting: 15%**

Submission 2 will be a peer-assessment of another groups work, providing critical review of their materials selection strategy

Weighting: 10%

Feedback: Comment/summary provided in each assessment to each group in conjunction with group mark

After both assessments, your individual group will report group members contributions to the work, which will be used to weight individual marks from the group marks.

Course Learning Outcomes

- CL04 : Apply communication and problem solving skills to identify ideal materials for design applications.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Generative AI Permission Level

Simple Editing Assistance

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Final exam

Assessment Overview

The exam will be 2 hours in length and held during the official examination period. The exam will consist of a mix of multiple choice, short answer and calculation style questions. Topics covered will include all those presented in the course lectures.

Students will receive their final grade during the official results release.

Course Learning Outcomes

- CLO1 : Describe the relationships between a materials multi-length-scale structure and its mechanical and functional properties.
- CLO2 : Classify materials into general groups of metals, ceramics, polymers and composites.

Assignment submission Turnitin type

Not Applicable

Hurdle rules

Students must achieve >40% on the final exam to pass the course.

Generative AI Permission Level

No Assistance

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For more information on Generative AI and permitted use please see [here](#).

General Assessment Information

Short Extensions:

The School of Materials Science and Engineering has reviewed its range of assignments and projects to determine their suitability for automatic short extensions as set out by the UNSW Short Extension Policy. After consultation with teaching staff and examination of our course offerings, we consider our current deadline structures already accommodate the possibility of unexpected circumstances that may lead students to require additional days for submission. Consequently, the School does not offer the Short Extension provision in its MATS courses but students, if needed, can apply for formal Special Consideration via the usual procedure.

Grading Basis

Standard

Requirements to pass course

If a student does not achieve greater than 40% in their final exam for this course, they will be awarded a UF (Unsatisfactory Fail), even if they achieve greater than 50% for the course overall.

Course Schedule

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

Please see the uploaded course schedule available on the main Moodle page for the course

Course Resources

Prescribed Resources

Please use the following links to access textbook resources as either hard copy or online:

Print:

<https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780081020517>

<https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780080966687>

Digital:

<https://unswbookshop.vitalsource.com/products/-v9780081020524>

<https://unswbookshop.vitalsource.com/products/-v9780080966694>

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
	Benjamin Pae					No	Yes
	John Daniels					No	No
	Bernd Gludovatz					No	No
	Caitlin Healy					No	No

Other Useful Information

Academic Information

Upon your enrolment at UNSW, you share responsibility with us for maintaining a safe, harmonious and tolerant University environment.

You are required to:

- Comply with the University's conditions of enrolment.
- Act responsibly, ethically, safely and with integrity.
- Observe standards of equity and respect in dealing with every member of the UNSW community.
- Engage in lawful behaviour.
- Use and care for University resources in a responsible and appropriate manner.
- Maintain the University's reputation and good standing.

For more information, visit the [UNSW Student Code of Conduct Website](https://student.unsw.edu.au/conduct).

Academic Honesty and Plagiarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at <https://student.unsw.edu.au/referencing>

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage. At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity, plagiarism and the use of AI in assessments can be located at:

- The [Current Students site](https://student.unsw.edu.au/current-students),
- The [ELISE training site](https://student.unsw.edu.au/elise), and
- The [Use of AI for assessments](https://student.unsw.edu.au/use-of-ai-for-assessments) site.

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

Submission of Assessment Tasks

Penalty for Late Submissions

UNSW has a standard late submission penalty of:

- 5% per day,
- for all assessments where a penalty applies,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Any variations to the above will be explicitly stated in the Course Outline for a given course or assessment task.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile Tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has been assessed, you will be contacted via your student email address to be advised of the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: <https://student.unsw.edu.au/special-consideration>

Important note: UNSW has a “fit to sit/submit” rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control that affect your ability to study, you do not sit an examination or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

Faculty-specific Information

Additional support for students

- [The Current Students Gateway](#)
- [Student Support](#)
- [Academic Skills and Support](#)
- [Student Wellbeing, Health and Safety](#)
- [Equitable Learning Services](#)
- [UNSW IT Service Centre](#)
- Science EDI Student [Initiatives](#), [Offerings](#) and [Guidelines](#)