



1 General Course Information

1.1 Course Details

Course Code:	1502ENG
Course Name:	Engineering Materials
Trimester:	Trimester 1, 2020
Program:	In Person
	Diploma of Engineering
	Mt Gravatt/Gold Coast Campus
Credit Points:	10
Course Coordinator:	Dr Lucija Boskovic
Document modified:	10 January 2020

Course Description

The course is designed for first year students enrolled on engineering programs. It considers the fundamental properties of metals and non-metallic materials. Students are introduced to the atomic and microstructure of materials and their relationship to mechanical and electrical properties. The course explores the mechanical concepts of stress, strain, elongation and material failure (including testing) and the phenomenon of electrical conduction.

Engineering Materials is a 10 credit point course within the Diploma of Engineering. The course is situated within the second semester of the program. The Diploma of Engineering is designed to provide students with a pathway to: further university studies in Engineering and related degrees; or direct employment.

Assumed Knowledge

There are no prerequisites for this course.

1.2 Teaching Team

Your lecturer/tutor can be contacted via the email system on the portal.

Dr Lucija Boskovic - lucija.boskovic@griffithcollege.edu.au

Dr Nima Talebian - nima.talebian@staff.griffithcollege.edu.au

1.3 Staff Consultation

Your lecturer/tutor is available each week for consultation outside of normal class times. Times that your lecturer/tutor will be available for consultation will be given in the first week of lectures. A list of times and rooms will be published on the Griffith College Portal under the "Support and Services/Teacher Consultation Times" link.

1.4 Timetable

Your timetable is available on the Griffith College Portal at Class Timetable in Student and Services

1.5 Technical Specifications

All students must have access to a computer or suitable mobile device

2. Aims, Outcomes & Generic Skills

2.1 Course Aims

This course aims to provide students with an understanding of the fundamental properties of basic engineering materials such as metals, ceramic, polymeric and composite materials, and their applications to 'real world' engineering problems. The course is supported by lectures, tutorial and laboratory-practicals. Problem solving exercises elaborating the lecture material are introduced during the lecture and tutorial time. Laboratory activities are set-up to provide students with the opportunity to clarify their own ideas on the content material, to develop teamwork and necessary problem solving skills, and to develop written communication skills. In addition, the laboratory sessions aim to develop students' competency in laboratory skills and the interpretation of the results of system measurements.

2.2 Learning Outcomes

After successfully completing this course you should be able to:

1. Categorize materials into four basic classifications (metal, ceramics, polymers and composites) in the laboratory environment.
2. Perform standard material property tests such as- tensile, hardness, and/or non-destructive testing and analyse the experimental results;
3. Calculate and analyse mechanical and elastic properties of materials.
4. Describe environmental and sustainability issues relevant to the use of metals, ceramics, polymers and composites.
5. Work independently, or as a team member, to manage materials science and engineering research activities and projects.

2.3 Generic skills

For further details on the Griffith Generic Skills please refer to the Graduate Generic Skills and Capabilities/ policy

Griffith College aims to develop graduates who have an open and critical approach to learning and a capacity for lifelong learning. Through engagement in their studies, students are provided with opportunities to begin the development of these and other generic skills.

Studies in this course will give you opportunities to begin to develop the following skills:

Generic Skills	Taught	Practised	Assessed
Knowledge and skills with critical judgement	✓	✓	✓
Communication and collaboration skills	✓	✓	✓
Self-directed and active learning skills	✓	✓	
Creative and future thinking skills	✓	✓	✓
Social responsibility and ethical awareness	✓	✓	✓
Cultural competence and awareness in a culturally diverse environment		✓	

3. Learning Resources

3.1 Required Resources

Callister,WD and Rethwisch, DG. (2014) Materials Science and Engineering: An Introduction 10e, Wiley.

3.2 Recommended Resources

3.3 College Support Services and Learning Resources

The College provides many facilities and support services to assist students in their studies. Links to information about College support resources that are available to students are included below for easy reference.

[Digital Library](#) – Databases to which Griffith College students have access to through the Griffith Library Databases.

MyStudy – there is a dedicated website for this course via MyStudy on the Griffith College Portal.

[Academic Integrity Tutorial](#) - this tutorial helps students to understand what academic integrity is and why it matters. You will be able to identify types of breaches of academic integrity, understand what skills you will need in order to maintain academic integrity, and learn about the processes of referencing styles.

Services and Support provides a range of services to support students throughout their studies including personal support such as Counselling; Academic support; and Welfare support.

Jobs and Employment in the [Student Hub](#) can assist students with career direction, resume and interview preparation, job search tips, and more.

[IT Support](#) provides details of accessing support, information on s numbers and internet access and computer lab rules.

3.4 Other Learning Information

Attendance

You are expected to attend all lectures and tutorials and to actively engage in learning during these sessions. You are expected to bring all necessary learning resources to class such as the required textbook and Tutorial and Workshop Guide. In addition, you may BYOD (bring your own device) to class such as a laptop or tablet. This is not a requirement as computer lab facilities are available on campus, however, the use of such devices in the classroom is encouraged with appropriate and considerate use principles being a priority.

Preparation and Participation in Class

In order to enhance learning, prepare before lectures and tutorials. Read the relevant section of your text book before a lecture, and for a tutorial read both the textbook and the relevant lecture notes. If you have been given tutorial exercises, make sure you complete them. Active participation in lectures and tutorials will improve your learning. Ask questions when something is unclear or when you want to bring some issue to your lecturer or tutor's attention; respond to questions to test your knowledge; engage in discussion to help yourself and others learn.

Consultation Sessions

Teachers offer extra time each week to assist students outside the classroom. This is known as 'consultation time.' You may seek assistance from your teacher on email or in person according to how the teacher has explained this to the class. Attendance during consultation time is optional but you are encouraged to use this extra help to improve your learning outcomes.

Course Materials

Lecture notes will be made available to you in MyStudy on the Griffith college Portal and you are advised to either print these out and bring them to each class so that extra notes can be added or BYOD (bring your own device) and add extra notes digitally.

Self-Directed Learning

You will be expected to learn independently. This means you must organise and learn the course content even when you are not specifically asked to do so by your lecturer or tutor. This involves revising the weekly course material. It also means you will need to find additional information for some assessment items beyond that given to you in textbooks and lecture notes, and to construct your own response to a question or topic. All of this requires careful planning of your time. Expect to spend, on average, at least 10 hours per week including class time for each of your courses.

Program Progression

You are reminded that satisfactory Program Progression requires that attendance in classes is maintained at equal to or greater than 80%, and that GPA is maintained at equal to or greater than 3.5 [please see Griffith College Policy Library - Program Progression Policy - for more information].

Teacher and course Evaluation

Your feedback is respected and valued by your lecturers and tutors. You are encouraged to provide your thoughts on the course and teaching, both positive and critical, directly to your lecturer and tutor or by completing course and lecturer evaluations via Griffith College's evaluation tool whenever these are available.

4. Learning and Teaching Activities

4.1 Weekly Learning Activities

Week	Topic	Activity	Readings	Learning Outcomes
1	Topic 1: Introduction to Materials	Lecture	Ch 1,	1,5
	Topic 1: Introduction to Materials	Tutorial	Ch1	1,5
2	Topic 2: Atomic Structure and Interatomic Bonding	Lecture	Ch 2	1,5
	Topic 2: Atomic Structure and Interatomic Bonding	Tutorial	Ch 2	1,5
3	Topic 3: Structure of Crystalline Solids and Imperfections in Solids	Lecture	Ch 3, 4	1,5
	Topic 3: Structure of Crystalline Solids and Imperfections in Solids	Tutorial	Ch 3, 4	1,5
4	Topic 4: Mechanical Properties of Metals	Lecture	Ch 6	1,2, 3 and 5
4	Topic 4: Mechanical Properties of Metals	Tutorial	Ch 6	1,2, 3 and 5
	Project 1 (Part A) laboratory session	Laboratory		1, 5
5	Topic 5: Failure of Engineering Materials	Lecture	Ch 8	1,2 and 5
	Topic 5: Failure of Engineering Materials	Tutorial	Ch 8	1,2 and 5
6	Revision of the Topics 1, 2, 3, 4 and 5	Lecture		1, 3
	Project 2 laboratory session 1	Laboratory		1,2, 3 and 5
	Mid-Trimester Exam	Examination		1, 3
7	Topic 6: Phase Diagrams	Lecture	Ch 9	1,5
	Topic 6: Phase Diagrams	Tutorial	Ch 9	1,5
	Project 2 laboratory session 2	Laboratory		1,2, 3 and 5
8	Topic 7 and 8: Ceramics and Polymers	Lecture	Ch 12, 13, 14 and 15	1,4
	Topic 7 and 8: Ceramics and Polymers	Tutorial	Ch 12, 13, 14 and 15	1,4
9	Topic 9: Composites	Lecture	Ch 16	1,4
	Topic 9: Composites Technical Writing Workshop: Topic: "How to Write a Literature Review"	Tutorial	Ch 16	1,4
10	Topic 10: Degradation and Corrosion of Materials	Lecture	Ch 17	1,4
	Topic 10: Degradation and Corrosion of Materials	Tutorial	Ch 17	1,4

11	Topic 11: Electrical Properties	Lecture	Ch 18	1,4
	Topic 11: Electrical Properties	Tutorial	Ch 18	1,4
12	Revision of the Topics 6, 7, 8, 9, 10 and 11	Lecture		1, 3
13 & 14	Final Exam	Examination		1, 3

5. Assessment Plan

5.1 Assessment Summary

Item	Assessment Task	Weighting	Learning Outcomes	Due Date
1	PROJECT 1: Materials Characterization & Selection	20%	1,5	Weeks 4 & 5
2	On-line Concept/Problem Examination	10%	1, 3, 4	Weeks 5 and 11
3	Mid-Trimester Exam	10%	1 and 3	Week 6
4	PROJECT 2: Mechanical Properties of Material	30%	1,2, 3 and 5	Week 8
5	PROJECT 3: Research on Properties of Materials	10%	5	Week 10
6	Final Exam	20%	1 and 3	Exam Week

5.2 Assessment Detail

Title: PROJECT 1: Materials Characterisation & Selection

Classification of various engineering materials (Part A - worth 4%) and video presentation (Part B - worth 16%) on atomic structure, composition, bonding and properties of common engineering materials are components of this project that you will be required to complete.

PROJECT 1 (Part A): laboratory session (Materials Characterisation)

This in-lab activity will be held in Week 4 and students will need to examine a set of material samples (metals, ceramics, polymers and composite materials) using only the equipment provided in the laboratory-practical session.

Title: On-line Concept/Problem Examination

You will be required to complete two online assignments in weeks 5 and 11 worth 5% each. The On-line Concept/Problem Examination will help you to prepare better for the mid-trimester and final exams and to practice more through the self-study time. The On-line Concept/Problem Examinations are combination of multiple choice, short/long answer, and calculation questions.

Title: Mid-Trimester and Final Exam

The closed book Mid-Trimester and Final exams worth 10% and 20%, respectively. They will be 90 minutes (Mid-exam) and 120 minutes (Final exam) in duration, plus 10-minute perusal. The test will assess the student's knowledge and understanding of the topics covered in the course and the ability to apply that understanding to the solution of practical problems. The examination paper is devised also to test the student's computational skills, as well as the ability to apply that knowledge to engineering design problems. Marks will be awarded according to correctness of the procedure, accuracy of the solution and clarity of the presentation.

Title: PROJECT 2: Mechanical Properties of Materials

You will be required to produce a Mechanical Properties of Materials Project Report worth 30% investigating various types of material (metals, ceramics, polymers and composite materials) and charactering their properties by means of supervised tensile tests and to develop the results in the form of a laboratory report.

PROJECT 2 laboratory session (Mechanical Properties of Materials)

During two laboratory-practical sessions in week 6 and 7, students will perform a supervised tensile tests of various materials (metals, ceramics, polymers and composite materials) and obtain required datafor the laboratory report.

Title: PROJECT 3: Research on Properties of Materials

In this project, you will be required to conduct literature review on properties and applications of an engineering material (or a group of materials) on one topic chosen from a set list. The report is worth 10% and should cover the specific aspects and applications of the materials as appropriate to the selected topic.

Requirements to pass the course:

Students are required to achieve at least 40% of combined mid-exam and final exam. Failure to reach to the above-mentioned 40% hurdle results in failing the course.

5.3 Late Submission

An assessment item submitted after the due date, without an approved extension from the Course Coordinator, will be penalised. The standard penalty is the reduction of the mark allocated to the assessment item by 5% of the maximum mark applicable for the assessment item, for each working day or part working day that the item is late. Assessment items submitted more than five working days after the due date are awarded zero marks.

Please refer to the Griffith College website - Policy Library > Assessment Policy for guidelines and penalties for late submission.

5.4 Other Assessment Information

Retention of Originals

You must be able to produce a copy of all work submitted if so requested. Copies should be retained until after the release of final results for the course.

Requests for extension

To apply for an extension of time for an assignment, you must submit an [Application for Extension of Assignment](#) form to your teacher at least 24 hours before the date the assignment is due. Grounds for extensions are usually: serious illness, accident, disability, bereavement or other compassionate circumstances and must be able to be substantiated with relevant documentation [e.g. [Griffith College Student Medical Certificate](#)]. Please refer to the Griffith College website - Policy Library - for guidelines regarding extensions and deferred assessment.

Return of Assessment Items

1. Marks awarded for in-trimester assessment items, except those being moderated externally with Griffith University, will be available on the Student Portal within fourteen [14] days of the due date. This does not apply to the final assessment item in this course (marks for this item will be provided with the final course result).
2. Students will be advised of their final grade through the Student Portal. Students can review their exam papers after student grades have been published (see relevant Griffith College Fact Sheet for allocated times at Support> Factsheets). Review of exam papers will not be permitted after the final date to enrol.
3. Marks for **all** assessment items including the final exam (if applicable) will be recorded in the Moodle Course Site and made available to students through the Moodle Course Site.

The sum of your marks overall assessment items in this course does not necessarily imply your final grade for the course. Standard grade cut off scores can be varied for particular courses, so you need to wait for the official release of grades to be sure of your grade for this course.

6. Policies & Guidelines

Griffith College assessment-related policies can be found in the [Griffith College Policy Library](#) which include the following policies:

Assessment Policy, Special Consideration, Deferred Assessment, Alternate Exam Sitting, Medical Certificates, Academic Integrity, Finalisation of Results, Review of Marks, Moderation of Assessment, Turn-it-in Software Use. These policies can be accessed using the 'Document Search' feature within the [Policy Library](#)

Academic Integrity Griffith College is committed to maintaining high academic standards to protect the value of its qualifications. Academic integrity means acting with the values of honesty, trust, fairness, respect and responsibility in learning, teaching and research. It is important for students, teachers, researchers and all staff to act in an honest way, be responsible for their actions, and show fairness in every part of their work. Academic integrity is important for an individual's and the College's reputation.

All staff and students of the College are responsible for academic integrity. As a student, you are expected to conduct your studies honestly, ethically and in accordance with accepted standards of academic conduct. Any form of academic conduct that is contrary to these standards is considered a breach of academic integrity and is unacceptable.

Some students deliberately breach academic integrity standards with intent to deceive. This conscious, pre-meditated form of cheating is considered to be one of the most serious forms of fraudulent academic behaviour, for which the College has zero tolerance and for which penalties, including exclusion from the College, will be applied.

However, Griffith College also recognises many students breach academic integrity standards without intent to deceive. In these cases, students may be required to undertake additional educational activities to remediate their behaviour and may also be provided appropriate advice by academic staff.

As you undertake your studies at Griffith College, your lecturers, tutors and academic advisors will provide you with guidance to understand and maintain academic integrity; however, it is also your responsibility to seek out guidance if and when you are unsure about appropriate academic conduct.

In the case of an allegation of a breach of academic integrity being made against a student he or she may request the guidance and support of a Griffith College Student Learning Advisor or Student Counsellor.

Please ensure that you are familiar with the Griffith College Academic Integrity Policy; this policy provides an overview of some of the behaviours that are considered breaches of academic integrity, as well as the penalties and processes involved when a breach is identified.

For further information please refer to the Griffith College website - Policy Library > Academic Integrity Policy

Reasonable Adjustments for Assessment – The Disability Services policy

The Disability Services policy (accessed using the Document Search' feature with the [Policy Library](#)) outlines the principles and processes that guide the College in making reasonable adjustments to assessment for students with disabilities while maintaining academic robustness of its programs.

Risk Assessment Statement

There are no out of the ordinary risks associated with this course.

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