1. General Course Information

1.1 Course Details

Course Code:	**1502ENG**
Course Name:	**Engineering Materials**
Trimester:	**Trimester 1, 2025**
Program:	**Diploma of Engineering**
Credit Points:	**10CP**
Course Coordinator:	**Sadaf Karkoodi**
Document modified:	**07/01/2025**

Course Description

The course is designed for first year students enrolled in 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 teacher/s can be contacted via email as below:

You will also find their email in the Teacher's tile on your Course Site.

Name	Email
Sadaf Karkoodi	Sadaf.Karkoodi@staff.griffithcollege.edu.au

1.3 Meet with your teacher

Your teacher is available each week to meet outside of normal class times. This is called consultation. Times that your teacher will be available for consultation will be found on the Teacher's tile on your Course Site.

1.4 Timetable

Your timetable is available on the Griffith College Digital Campus at My Apps, Timetable.

1.5 Technical Specifications

All students must have access to a computer or suitable mobile device such as laptop or tablet (mobile phones are not suitable). In addition, up-to-date browser access, a reliable high-speed internet connection with enough upload and download capacity, a webcam and headset including microphone are needed.

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.

2.2 Learning Outcomes

After successfully completing this course you should be able to:

1. Acquire a fundamental understanding of key concepts in materials science and engineering (e.g., atomic composition, bonding type, strength, density, electronegativity, etc.) that connect the properties and processing of basic engineering materials to their practical applications.
2. Gain a basic understanding of how materials are applied across various scientific and engineering fields to enable integrated, system-wide solutions.
3. Apply theoretical knowledge through hands-on laboratory experiments to perform both destructive and non-destructive tests (e.g., tensile, compression, hardness, thermal degradation, etc.) to evaluate and report on measured materials properties.
4. Demonstrate understanding of key theoretical concepts in materials science by applying appropriate principles, formulas, and terminology to solve problems and answer questions in structured assessments, such as tests, quizzes, or examinations.
5. Develop effective written and oral communication skills to present technical concepts, processes and outcomes, working both independently and collaboratively in a group setting on research and reporting tasks.

2.3 Graduate Capabilities and Employability Skills

For further details on the Graduate Capabilities and Employability Skills please refer to the Graduate Generic Skills and Abilities Policy.

Griffith College is committed to producing graduates who are able to demonstrate progress toward the development of a number of generic skills / capabilities that will allow them to successfully continue their studies at the tertiary level. This set of skills includes employability related skills that will ensure graduates are capable in the workplace of the future.

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

Graduate Capabilities and Employability Skills			Focus within this course
Interacting with People	Teamwork		✓
	Communication		
	Respect for Culture and Diversity		
Readiness for the Workplace	Problem Solving		✓
	Planning and Organisation		
	Creativity and Future Thinking		

3. Learning Resources

3.1 Required Learning Resources

Callister, WD, and Rethwisch, DG. (2018) Materials Science and Engineering: An Introduction 10e, Wiley.

3.2 Recommended Learning Resources

Askeland, DR, and Wright WJ. (2016) The Science and Engineering of Materials 7e, Cengage Learning.

3.3 College Support Services and Learning Resources

Griffith College provides many facilities and support services to assist students in their studies. Links to information aboutsupport 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.
- Study Toolbox – there is a dedicated website for this course on the Griffith College Digital Campus.
- Academic Integrity - Griffith College is committed to ensuring academic integrity is understood and maintained byall staff and students. All students learn about academic integrity through engagement with Academic Integrity online modules within the Academic and Professional Studies course.
- Services and Support provides a range of services to support students throughout their studies including academicadvice and assignment help from Student Learning Advisors, and personal and welfare support from Student Counsellors.
- 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 Information about your Learning

Preparation and Participation in Learning

You need to prepare before attending your scheduled Learning Experience (In Class). Work through the Learning Content (Before Class) prepared by your teacher which is found on the course site. Make sure you complete the Learning Activities (After Class) set each week. Active participation in your learning will enhance your success. Ask questions when something is unclear or when you want to bring some issue to your teacher's attention; respond to questions to test your knowledge and engage in discussion to help yourself and others learn.

Attendance

You are expected to actively engage in all learning experiences which underpin the learning content in this course. Attendance will be recorded by your teacher in each learning experience to ensure you are meeting the requirements of the program you are studying and/or your visa conditions. You are expected to engage with the learning content and learning activities outside of timetabled class times. You are expected to bring all necessary learning resources to class such as the required textbook and /or Workbook.

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 Learning Materials

Learning materials are made available to you in the course site. The learning materials are arranged in Modules. In each Module you will find Learning Content (Before Class), Learning Experiences (In Class) and Learning Activities (After Class). **Learning Content (Before Class)** will be engaged with prior to the scheduled **Learning Experience (In Class)**. This will ensure you are prepared for the scheduled Learning Experience (In Class) by being aware of the content to be covered and therefore will be able to actively participate in the session. **Learning Activities (After Class)** are accessed after the scheduled session for purposes of review, consolidation of learning, and preparation for the Evidence of Learning Tasks (Assessments) in the course.

Self-Directed Learning

You will be expected to learn independently. This means you must organise and engage with the course Learning Content (Before Class) even when you are not specifically asked to do so by your teacher. The weekly guide (below) will be helpful to organise your learning. This involves revising the weekly course Learning Content (Before Class) and completing the Learning A ctivities (After Class). It also means you will need to find additional information to evidence your learning beyond that given to you, 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%, students are engaged in their learning 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].

International students enrolled in Language Development Modules (LDM100 / LDM200 or LDH100 / LDH200)

Successful completion of LDM100 and LDM200 or LDH100 and LDH200 is **required** to graduate with your Diploma award and progress to your Bachelor. If you do not achieve non-graded passes for these language modules your progression to your Bachelor will be affected. Please attend all your classes and submit your assessment.

Teacher and Course Evaluation

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

4. Weekly Guide: Learning Content, Learning Experiences and Learning Activities

The information below lays out how your learning will be organised throughout the trimester:

Week	Learning Content (Before Class)	Learning Experiences (In Class)	Learning Activities (After Class)	Evidence of Learning (Assessment)	Learning Outcome
					
	Module 1: Engineering materials and corresponding structures				
1	Topic 1: Introduction to Materials	Practice problem solving questions on classification of materials	Homework activities on classification of materials		1
2	Topic 2: Atomic Structure and Interatomic Bonding	Practice problem solving questions on atomic structure	Homework activities on atomic structure **Laboratory session 1a**	PROJECT 1: Part A - Materials Characterization & Selection due in lab week 3	1
3	Topic 3: Structure of Crystalline Solids and Imperfections in Solids	Practice problem solving questions on crystalline solids; Preparation for PROJECT 1: Materials Characterization & Selection	Homework activities on crystalline structures; **Laboratory session 1b**	PROJECT 1: Part B - Materials Characterization & Selection due in the lab session in week 4	1
	Module 2: Mechanical Properties and failures of engineering materials				
4	Topic 4: Mechanical Properties of Metals	Practice problem solving questions on mechanical properties Preparation for PROJECT 1: Materials Characterization & Selection	Homework activities on mechanical properties **Laboratory session 1c**		1, 2

5	Topic 5: Failure of Engineering Materials	Practice problem solving questions on failure of materials Preparation for PROJECT 2: Mechanical properties of materials	Homework activities on failure of materials; **Laboratory session 2a**	PROJECT 2: Mechanical Properties of Material due in week 9	2
6	Topic 6: Phase Diagrams	Practice problem solving questions on phase diagrams Preparation for PROJECT 2: Mechanical properties of materials	Homework activities on phase diagrams; **Laboratory session 2b**		2
7	Topic 7: How to write a literature review	Preparation for PROJECT 2: Mechanical properties of materials	Read and review documentation on literature reviews **Laboratory session 2c**	Test or Quiz: MID-TRIMESTER TEST Test is offered during the regular week 7 TUT class	2
	Module 3 Ceramics, Polymers, Composites and some other non-mechanical properties of engineering				
8	Topic 8: Ceramics	Practice problem solving questions on ceramics and polymers Preparation for PROJECT 2: Mechanical properties of materials	Homework activities on ceramics **Laboratory session 2d**		3
9	Topic 9: Polymers	Practice problem solving questions on ceramics and polymers	Homework activities on polymers; **Laboratory session 3**	PROJECT 3: Research on Properties of Materials due Friday week 12.	2
10	Topic 10: Composites	Practice problem solving questions on composites;	Homework activities on composites;		2, 3
11	Topic 11: Degradation and Corrosion of Materials and electrical properties	Practice problem solving questions on corrosion Preparation for Project 3 - Research on Properties of Materials	Homework activities on corrosion Homework activities on electrical properties		3
12	Topic 12: Economic and Environmental Factors: Material costs, Global reserves, Recycling and waste management, Substitution of rare and hazardous materials	Preparation for Project 3 - Research on Properties of Materials and sustainable development			3

4.2 Practical Laboratory Classes

Practical laboratory classes commence in Week 2 and are delivered every week until Week 9. Topics are detailed in 4.1 Learning Experience Simulation Laboratory sessions. Please look out for the timetable details.

5 Evidence of Learning (Assessment)

5.1 Evidence of Learning Summary

	Evidence of Learning (Assessment)	Weighting	Learning Outcome	Due Date
				
1	PROJECT 1: Materials Characterization & Selection	10%	1	Week 3 and 4
2	PROJECT 2: Mechanical Properties of Material	30%	2	Week 9
3	PROJECT 3: Research on Properties of Materials	10%	3	Week 12
4	Exam - selected and constructed responses FINAL EXAM	50% **(25% Pass Component)**	1, 2, 3	Examination Period

5.2 Evidence of Learning Task Detail

You are required to **submit your own work** for marking. All planning, notes and drafts need to be retained so they can be presented to your teacher if requested.

Tools that generate course content or extensively enhance a student's English language capability are not permitted to be used. Web applications such as ChatGPT, Google Translate, Grammarly and Youdao (or equivalent services) are not permitted for outright assessment creation, translation, or extensive language assistance purposes. In addition, Wikipedia, Baidu, Weibo and WeTalk are not permitted to be used.

Students should follow all teacher directions about the use of Generative Artificial Intelligence (Gen-AI) tools in relation to formative and summative assessment tasks (including how to cite Gen-AI tools, if relevant). It should be noted that Turnitin provides teaching staff with a Gen-AI percentage indicator as well as an Originality Report which detects plagiarism.

1. Evidence of Learning Task 1: Project 1: Materials Characterisation & Selection (10%)

Task Type: Presentation; Examination
Due Date: Part A – In class week 3, Part B– In class week 4 – (21/03/2025)
Weight: 10%
Task Description: Classification of various engineering materials samples presentation (Part B – worth 5%) and in class test (Part A - worth 5%). Atomic structure, composition, bonding, and properties of common engineering materials are components of this project that students will be required to complete.
Criteria and Marking: Correctness of answers will be assessed based on an appropriate marking scheme. Final marks posted on Griffith College portal.
Submission: In Class quiz, In Class Presentation

2. Evidence of Learning Task 3: PROJECT 2: Mechanical Properties of Materials (30%)
Task Type: Assignment – Written Assignment
Due Date: (09/05/2025)
Weight: 30%

Task Description: You will be required to produce a Project Report worth 20% investigating various types of materials and their corresponding mechanical properties. During the laboratory sessions in weeks, 5, 6, 7 and 8 tensile tests of various materials (metals, ceramics, polymers, and composite materials) will be demonstrated and the corresponding data needed for Project 2 will be shared.
Criteria and Marking: Correctness of answers will be assessed based on an appropriate marking scheme.
Final marks posted on Griffith College portal**.**
Submission: in-class submission of lab reports

3. Evidence of Learning Task 4: PROJECT 3: Research on Properties of Materials (10%)

Task Type: Assignment – Written Assignment
Due Date: (30/05/2025)
Weight: 10%

Task Description In this project, you will be required to conduct a 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.
Criteria and Marking: Correctness of answers will be assessed based on an appropriate marking scheme. Final marks posted on Griffith College portal**.**
Submission: Turnitin via the course site.

4. Evidence of Learning Task 5: FINAL Exam - selected and constructed responses (50%)
Task Type: Assignment – Written Assignment
Due Date: Examination Period
Weight: 50%
Task Description The final examination assesses student's overall understanding and level of attainment of the course in a closed book and timed examination environment. The exam is comprised of multiple-choice questions, qualitative and quantitative problems.
Criteria & Marking:
Descriptive and qualitative answers are graded on demonstrated understanding of the concepts and clarity of expression.
Quantitative answers are graded on
(1) accuracy of solution methodology (this will include an assessment of the structure and clarity of the solutions presented),
(2) accuracy and correctness of the answer
(3) appropriate use of units.
Weighting for multiple choice and written responses will be provided on the examination paper.

This assessment item:
• is a centrally organized activity
• is an individual activity
• does not include a self-assessment activity
• contains a mandatory pass component

In order to pass this Course, students must:

A. Demonstrate assurance of learning of all learning outcomes through graded Evidence of Learning Tasks.
B. Students are required to achieve at least 25 out of 100 marks in the final exam.

5.3 Late Submission

An Evidence of Learning Task submitted after the due date, without an approved extension from the teacher, will be penalised. The standard penalty is the reduction of the mark allocated to the Evidence of Learning Task by 5% of the maximum mark applicable for the Evidence of Learning Task, for each calendar day that the task is late. Evidence of learning tasks submitted more than seven calendar 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 Information about Evidence of Learning

Retention of Originals

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

Requests for extension

To apply for an extension of time for an evidence of learning task, 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 Evidence of Learning Tasks.

Return of Evidence of Learning Tasks

1. Marks awarded for in-trimester evidence of learning tasks, except those being moderated externally with Griffith University, will be available on the course site within fourteen [14] days of the due date. This does not apply to the final evidence of learning task in this course (marks for this task will be provided with the final course result).

2. Students will be advised of their final grade through the Digital Campus. Students can review their final exam papers after student grades have been published. Review of final exam papers will not be permitted after the final date to enrol.

3. Marks for **all** evidence of learning tasks including the final exam (if applicable) will be recorded in the Course Site and made available to students through the Course Site.

The sum of your marks of evidence of learning *tasks 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 Evidence of Learning Tasks-related policies can be found in the Griffith College Policy Library which include the following policies:

Assessment Policy, Special Consideration, Deferred Assessment, Alternate Exam Sittings, Medical Certificates,Academic Integrity, Finalisation of Results, Review of Marks, Moderation of Assessment, Turn-it-in Software Use. These policies can be accessed 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 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 teachers and academic advisors will provide you with guidanceto understand and maintain academic integrity; however, it is also your responsibility to seek out guidance if and whenyou 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 mayrequest 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 Evidence of Learning Tasks –

The Disability Services Policy (accessed within the Policy Library) outlines the principles and processes that guide the College in making reasonable adjustments to Evidence of Learning Tasks for students with disabilitieswhile maintaining academic robustness of its programs.

Risk Assessment Statement

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