

# ENGR 1048 ENGINEERING MATERIALS (UG CERT)

**Credit Points** 10

**Legacy Code** 500066

**Description** This unit will introduce fundamentals of engineering materials. The topics will include materials structure, properties, processing and applications, degradation of materials, sustainability and the selection of materials for various engineering applications.

**School** Eng, Design & Built Env

**Discipline** Other Engineering And Related Technologies

**Student Contribution Band** HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Undergraduate Level 1 subject

**Equivalent Subjects** ENGR 1008 Engineering Materials ENGR 1014 Engineering and Design Concepts ENGR 1009 Engineering Materials (WSTC AssocD) ENGR 1010 Engineering Materials (WSTC) ENGR 1034 Engineering and Design Concepts (WSTC) LGYB 0481 Engineering and Design Concepts (WSTC AssocD)

**Restrictions** Students must be enrolled in the program : 7178 Diploma of Aerotropolis Industry 4.0 (Mechatronic Skills) or 7182 Undergraduate Certificate in Engineering

## Learning Outcomes

On successful completion of this subject, students should be able to:

1. Describe and identify the atomic structure, bonding, crystal structure and defects of materials.
2. Explain the various properties of materials (eg mechanical, thermal, electrical, optical, magnetic).
3. Identify and explain the mechanical failures, corrosion and degradation of materials and how to prevent them.
4. Select an appropriate material for a given application.
5. Apply sustainability principles in engineering practice.

## Subject Content

1. Atomic structure and interatomic bonding
2. Crystalline structure and defects in solids
3. Various properties of materials (mechanical, thermal, electrical, magnetic and optical)
4. Metals, ceramics and glasses, polymers, composites and advanced materials
5. Diffusion and phase diagrams
6. Corrosion and degradation of materials
7. Materials selection
8. Materials and sustainability

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/Group Task
Real-world problem diagnosis and analysis (Part A)	450 words	15	N	Individual
Real-world problem diagnosis and analysis (Part B)	450 words	15	N	Individual
Lab analysis & report: Crystal structures	600 words	20	N	Individual
Lab analysis & report: Mechanical properties	600 words equivalent	20	N	Individual
Case study: Material selection and eco-audit	900 words	30	N	Individual

Teaching Periods