

# PROC 1008 INTRODUCTION TO MATERIALS ENGINEERING

**Credit Points** 10

**Legacy Code** 301421

**Coordinator** Qinghua Zeng ([https://directory.westernsydney.edu.au/search/name/Qinghua Zeng/](https://directory.westernsydney.edu.au/search/name/Qinghua%20Zeng/))

**Description** Modern science and technology is highly dependent on materials whose properties can be controlled to accommodate a wide range of applications. Materials are of the utmost importance for scientists and engineers who need to select appropriate materials for system design and engineering applications. Students will explore the structure and properties of all types of materials, including metals, ceramics, polymers and composites through theories, principles and a range of experiments. Participation in the lab experiments puts theoretical knowledge into practice enhancing each student's understanding of materials properties, diffusion mechanisms, corrosion, and degradation as well as ways to achieve equilibrium. Graduates who have completed this subject may pursue careers as materials scientists, engineers, researchers, or consultants in industries such as aerospace, automotive, electronics, energy, biomedical, and manufacturing, among others.

**School** Eng, Design & Built Env

**Discipline** Materials Engineering

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

Check your fees 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 1010 - Engineering Materials (WSTC)

## Learning Outcomes

1. Describe the basic principles of materials science, including atomic structure, crystallography, diffusion, phase diagrams, and the relationships between material properties and structure.
2. Analyse phase diagrams to determine the phase composition, transformations and the development of microstructures in a material.
3. Explain the properties of common materials such as metals, polymers, ceramics, and composites.
4. Apply the knowledge of materials science to solve practical problems.
5. Design experiments and projects that incorporate materials science principles.
6. Implement basic laboratory safety procedures and work collaboratively to maintain a safe and productive environment.
7. Work effectively in a team to analyse and communicate scientific ideas and achieve project goals, as required by the tasks at hand.

## Subject Content

1. Structures of materials including metals, ceramics, polymers and composites
2. Diffusion
3. Phase diagrams

4. Mechanical and physical properties of materials
5. Corrosion and degradation of materials

## 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.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Participation	60 minutes (each week)	10	N	Individual	Y
Practical	500-1000 words equivalent (each lab)	30	N	Group/ Individual	N
Quiz	45 minutes (per quiz) x2	40	N	Individual	N
Final Exam	2 hours	20	N	Individual	N

Teaching Periods

## Spring (2024) Penrith (Kingswood)

**On-site**

**Subject Contact** Qinghua Zeng ([https://directory.westernsydney.edu.au/search/name/Qinghua Zeng/](https://directory.westernsydney.edu.au/search/name/Qinghua%20Zeng/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=PROC1008\\_24-SPR\\_KW\\_1#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=PROC1008_24-SPR_KW_1#subjects))

## Parramatta City - Macquarie St

**On-site**

**Subject Contact** Qinghua Zeng ([https://directory.westernsydney.edu.au/search/name/Qinghua Zeng/](https://directory.westernsydney.edu.au/search/name/Qinghua%20Zeng/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=PROC1008\\_24-SPR\\_PC\\_1#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=PROC1008_24-SPR_PC_1#subjects))

## Sydney City Campus - Term 3 (2024) Sydney City

**On-site**

**Subject Contact** Peter Lendrum ([https://directory.westernsydney.edu.au/search/name/Peter Lendrum/](https://directory.westernsydney.edu.au/search/name/Peter%20Lendrum/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=PROC1008\\_24-SC3\\_SC\\_1#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=PROC1008_24-SC3_SC_1#subjects))

## Sydney City Campus - Term 2 (2025) Sydney City

**On-site**

**Subject Contact** Peter Lendrum ([https://directory.westernsydney.edu.au/search/name/Peter Lendrum/](https://directory.westernsydney.edu.au/search/name/Peter%20Lendrum/))

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=PROC1008\\_25-SC2\\_SC\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=PROC1008_25-SC2_SC_1#subjects))

## **Spring (2025)**

### **Penrith (Kingswood)**

#### **Hybrid**

**Subject Contact** Qinghua Zeng ([https://directory.westernsydney.edu.au/search/name/Qinghua Zeng/](https://directory.westernsydney.edu.au/search/name/Qinghua%20Zeng/))

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=PROC1008\\_25-SPR\\_KW\\_3#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=PROC1008_25-SPR_KW_3#subjects))

### **Parramatta City - Macquarie St**

#### **Hybrid**

**Subject Contact** Qinghua Zeng ([https://directory.westernsydney.edu.au/search/name/Qinghua Zeng/](https://directory.westernsydney.edu.au/search/name/Qinghua%20Zeng/))

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