

PROC 1008 INTRODUCTION TO MATERIALS ENGINEERING

Credit Points 10

Legacy Code 301421

Coordinator Qinghua Zeng (<https://directory.westernsydney.edu.au/search/name/Qinghua Zeng/>)

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/) 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

Sydney City Campus - Term 2 (2025)

Sydney City

On-site

Subject Contact Peter Lendum (<https://directory.westernsydney.edu.au/search/name/Peter Lendum/>)

View timetable (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/>)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=PROC1008_25-SPR_KW_3#subjects)

Parramatta City - Macquarie St

Hybrid

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View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=PROC1008_25-SPR_PC_3#subjects)