



# Unit Outline (Higher Education)

<b>Institute / School:</b>	Institute of Innovation, Science & Sustainability
<b>Unit Title:</b>	Mineral Processing I
<b>Unit ID:</b>	SCMET3100
<b>Credit Points:</b>	15.00
<b>Prerequisite(s):</b>	Nil
<b>Co-requisite(s):</b>	Nil
<b>Exclusion(s):</b>	Nil
<b>ASCED:</b>	030305

**Description of the Unit:**

Mineral processing is a major and vital part of the mining industry. This unit allows participants to develop knowledge of the principles and practices applied in the mineral processing area. It will equip participants with technical skills and abilities to analyse how mineral processing fits into the economy of the industry, and, develop solutions to the challenges and efficiencies of extracting any valuable mineral or metal.

**Grade Scheme:** Graded (HD, D, C, P, MF, F, XF)

**Work Experience:**

No work experience

**Placement Component:** No

**Supplementary Assessment:** Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

**Course Level:**

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Learning Outcomes:**

On successful completion of the unit, the students are expected to be able to apply:

**Knowledge:**

- K1.** Recognise and explain the significance of mineral processing in the mining industry and its impact on the industry economy
- K2.** Identify closed and open comminution systems, describe the essential difference between them, and recognise their importance in the design of mineral processing plants.
- K3.** Identify the essential difference between crushing and grinding processes.
- K4.** Identify critical operating parameters of different equipment and understand the systems for monitoring and controlling them.
- K5.** Discuss the principles of gravity separation and interpret their importance in the design of gravity concentrating circuits.
- K6.** Evaluate the importance of maintenance and any required adjustment of the mineral processing plant equipment including size reduction units, classifiers, and gravity separation equipment.

**Skills:**

- S1.** Investigate and solve problems involving systems commonly found in mineral processing applications
- S2.** Investigate, and present evidence of, problem-solving and calculations within mineral processing in a clear, logical, and concise way.
- S3.** Analyse and create graphical presentations of technical data commonly generated in mineral processing applications.
- S4.** Compare and contrast equipment typically used in minerals processing and interpret laboratory-scale units.
- S5.** Evaluate the performance of laboratory-scale mineral processing units with respect to industrial standards.

**Application of knowledge and skills:**

- A1.** Synthesize from the knowledge gained and develop solutions to comminution and gravity separation circuits in a range of technical functions.
- A2.** Solve real mineral processing problems through symbolic, numeric, and experimental analysis.

**Unit Content:**

Topics may include:

- Mineralogical assessment
- Sampling theory and Gy's formula
- Metallurgical accounting
- Comminution processes - crushing and grinding
- Laboratory and industrial screening
- Classification methods
- Gravity separation processes
- Dense media separation
- Coal preparation

**Learning Task and Assessment:**

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-5, S1-3, A1-2	Tutorial problems	Assignment	20% - 40%
K3-6, S1-5, A1-2	Practical exercises	Reports on practical exercises	20% - 40%
K1-5, S1-5, A1-2	Engagement in all learning activities including attendance and participation in classes, exercises, recommended and supplementary readings and other activities as suggested.	Test	40% - 60%

**Adopted Reference Style:**

Australian Harvard

Refer to the [library website](#) for more information

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