



# Unit Outline (Higher Education)

**Institute / School:** Institute of Innovation, Science & Sustainability

**Unit Title:** ROCK FRAGMENTATION

**Unit ID:** ENGIN2502

**Credit Points:** 15.00

**Prerequisite(s):** Nil

**Co-requisite(s):** Nil

**Exclusion(s):** (ENMIN2040)

**ASCED:** 030303

**Description of the Unit:**

Students will develop their knowledge in the area of drilling and blasting for both surface and underground mining.

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

**Work Experience:**

No work experience: Student is not undertaking work experience in industry.

**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"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input 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:

**Knowledge:**

- K1.** Understand the principles of different drilling operations.
- K2.** Understand the principles of different blasting operations.
- K3.** Recognise the importance of why drilling and blasting must be considered together in both surface and underground mining operations.
- K4.** Identify the potential environmental effects of blasting.

**Skills:**

- S1.** Analyse and solve problems of complex drilling and blasting.
- S2.** Select different explosive types and their use for particular applications.
- S3.** Evaluate different drilling and blasting design methods for both surface and underground operations.

**Application of knowledge and skills:**

- A1.** Synthesise and design short, medium and long-term plans and schedules for drilling and blasting for surface mines.
- A2.** Synthesise and design short, medium and long-term plans and schedules for drilling and blasting for sub-surface mines.

**Unit Content:**

Topics may include:

- Production drilling machines
- Bits and drilling accessories
- Explosive types
- Explosive properties and characteristics
- New explosive products
- Principles of blasting
- Initiation systems
- Small scale drilling and blasting
- Large scale methods and mass blasting

- Crater blasting systems
- Controlled blasting techniques
- Vibrations and air blast
- Secondary breaking
- Case studies and costs
- Kinetics of a particle  $F = ma$ , work and energy, impulse and momentum

**Learning Task and Assessment:**

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K4, S1-S3, A1-A2	A comprehensive design exercise(s) will be undertaken that has a range of conceptual questions posed within it.	One or more assignments.	40 - 60%
K1-K4, S1-S3, A1-A2	An examination on any or all of the material covered in the unit.	Examination	40 - 60%

**Adopted Reference Style:**

Other (IEEE: Refer to the library website for more information)

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

Fed Cite - [referencing tool](#)