Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: ROCK MECHANICS APPLICATION

Unit ID: ENGPG9403

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): (ENGIN2503)

ASCED: 030909

Description of the Unit:

This unit introduces elasticity, rock mechanics and their applications in rock structure designs, rock support designs and ground control in surface and underground mines.

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						
Intermediate			✔			
Advanced						

Learning Outcomes:

Knowledge:

K1. Understand the principles involved in theory of elasticity
K2. Recognise rock as a structural material and analyse the applicability of classical elasticity principles to rock structures
K3. Interpret rockmass classification depending on its structural quality, in-situ stress field and groundwater regime
K4. Analyse stress re-distributions due to the excavation processes
K5. Assess support systems appropriate to a particular excavation

Skills:

S1. Investigate rock stress and strain analysis in mining
S2. Investigate ground control analysis, select appropriate support systems; and refine the design processes
S3. Apply knowledge in rock mechanics for rock structure designs in surface and underground mines
S4. Apply advanced mining design software to design and analysis of typical rock structures used in mining

Application of knowledge and skills:

A1. Analyse rock stress in mining environment
A2. Analyse rock/ground deformation in mining environment
A3. Design rock structures used in mining, observing safety and economic requirements

Unit Content:

Topics may include:

- Overview of Theory of Elasticity
- Rock as a structure
- Strength & Deformation of rock
- In-situ stresses
- Methods of Excavation Analysis
- Stresses around excavations
- Stability evaluation of rock structures
- Evaluation of support requirements

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K4, S1-S2 and A1-A2	A selection of tutorials will be assessed though out the unit.	Assessed tutorials.	20-30%
S3-S4 and A3	A laboratory or field based practical exercise will be undertaken and assessed.	A technical/project/lab report.	20-30%
K1-K5, S1-S4 and A1-A3	Any or all material covered in the unit will be examinable.	Test(s)	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