



Course Outline (Higher Education)

Institute: Institute of Innovation, Science & Sustainability

Course Title: ROCK MECHANICS APPLICATIONS

Course ID: ENGIN2503

Credit Points: 15.00

Prerequisite(s): (ENCOR2030 or ENGIN2301)

Co-requisite(s): Nil

Exclusion(s): (ENMIN3040 and ENMIN5160)

ASCED: 030909

Description of the Course:

This course 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 course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	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 checked="" 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:

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

Course 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

Values:

- V1.** Recognise the diversity of factors influencing the design and analysis of typical rock structures used in mining, such as process characteristics, environmental and human factors, legal and economical issues
- V2.** Recognise all responsibilities encompassed by the life cycle of mine excavations
- V3.** Commit to quality, ethical standards, occupational health and safety
- V4.** Recognise learning as a lifelong process

Graduate Attributes

The Federation University Federation graduate attributes (GA) are entrenched in the [Higher Education Graduate Attributes Policy](#) (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	S1-S4	Assignments, Project and Lab work
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	A1-A3	Assignments, Project and Lab work
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	V1-V4	Assignments, Project and Lab work
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K1-K5, S1-S4, A1-A3	Assignments, Project and Lab work
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	K4, S3-S4, V1-V3	Assignments, Project and Lab work

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1-K4, S1-S2 and A1-A2	A selection of tutorials will be assessed though out the course.	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 course 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](#)