Course Outline (Higher Education)

Institute: Institute of Innovation, Science & Sustainability

Course Title: MINERAL PROCESSING I

Course ID: SCMET3100

Credit Points: 15.00

Prerequisite(s): NIL

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED: 030305

Description of the Course:
Mineral processing is a major and vital part of the mining industry. This course 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: 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						
Intermediate						
Advanced			✔			

Learning Outcomes:

On successful completion of the course, 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.

Course 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

Values:

V1. Develop lifelong learning skills by critical analysis of complex mineral processing systems

V2. Understand the role and economic limitations of size reduction and liberation in the performance of gravity separation processes

V3. Appreciate the environmental implications of plant design

V4. Recognise the role of science, engineering, and good operating practice in overall efficiency, safety, and reliability within mineral processing systems

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.	K1-K5, S1-2, S5, A1-2	AT1-3
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.	K4, K5, S3-4, A1-2	AT1-2
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.	K1-6, S1-5, A1-2	AT2
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.	K1-6, S1-5, A1-2	AT1-2
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.	K1-6, S1-5, A1-2	AT2

Learning Task and Assessment:

Learning Outcomes Assessed	Learning 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, recomended and supplementary readings and other activities as sugested.	Test	40% - 60%

Adopted Reference Style:

Australian Harvard

Refer to the library website for more information

Fed Cite - referencing tool