



FACULTY OF ENGINEERING AND THE ENVIRONMENT

DEPARTMENT OF MINING ENGINEERING

**MINE MANAGEMENT**

**EMI5102**

Final Examination Paper

November/December 2024

This paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner: Mr. D Jaibes

### **INSTRUCTIONS**

1. This paper contains SIX questions.
2. Answer any FOUR questions.
3. Each question carries 25 marks.
4. Where a question contains subdivisions, the mark value of each subdivision is shown in brackets.
5. Illustrate your answer, where appropriate, with clearly labelled diagrams.
6. Start each question on a new page.
7. Be concise and ensure clarity in your answers.
8. Support your answers with relevant examples and references where appropriate.
9. This paper comprises 3 printed pages

Additional requirements:

Calculator

**Question 1:**

- a) Discuss the principles of integrated mine planning and how they contribute to operational efficiency. (10 Marks)
- b) Evaluate the role of life-of-mine planning in sustainable mining practices. (10 Marks)
- c) Analyse the potential challenges faced in implementing an integrated mine planning approach. (5 Marks)

**Question 2:**

- a) Examine the key regulations that govern mining operations at a national and international level. (10 Marks)
- b) Discuss the importance of corporate governance in the mining sector, including ethical considerations. (10 Marks)
- c) Identify and explain the implications of non-compliance for mining companies. (5 Marks)

**Question 3:**

- a) Define and compare qualitative and quantitative risk assessment methods in mining. (10 Marks)
- b) Propose a framework for implementing a risk management plan in a mining operation, detailing each step. (10 Marks)
- c) Critically assess how emerging technologies can enhance risk management in mining. (5 Marks)

**Question 4:**

- a. Articulate the role of the 4<sup>th</sup> industrial revolution in the contemporary mining and mineral processing industry (15 Marks)
- b. Explain the role of engineering managers in a mining organization. (10 Marks)

**Question 5:**

- a) Evaluate the impact of automation and digitalization on mining productivity and safety.  
(10 Marks)
- b) Discuss the challenges and barriers to adopting new technologies in traditional mining environments. (10 Marks)
- c) Identify three emerging technologies in mining and analyze their potential applications.  
(5 Marks)

**Question 6:**

- a) Outline the essential components of a mining operation's effective crisis management plan. (10 Marks)
- b) Analyse the role of communication in crisis management and the potential pitfalls to avoid. (10 Marks)
- c) Provide examples of real-world mining crises and evaluate the response strategies' effectiveness. (5 Marks)

**End of Examination Paper**