

Occupational Curriculum Document				
Curriculum Code	Curriculum Title			
311701-001	Mine Planning Officer			
Document Status				
DRAFT				
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SECTION I: Curriculum Overview

1. National Occupational Pathway Information

1.1. Occupational Cluster

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1.2. Occupational Field

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2. Occupational Information

2.1. Related Occupations

311701 - 001	Mine Planner: Underground Hardrock
Mine Planners: Design, programme and schedule the exploitation of the mineral body in order to convert the mineral resource into mineral reserves for the safe, healthy and profitable extraction of the minerals in line with organisational strategies.	

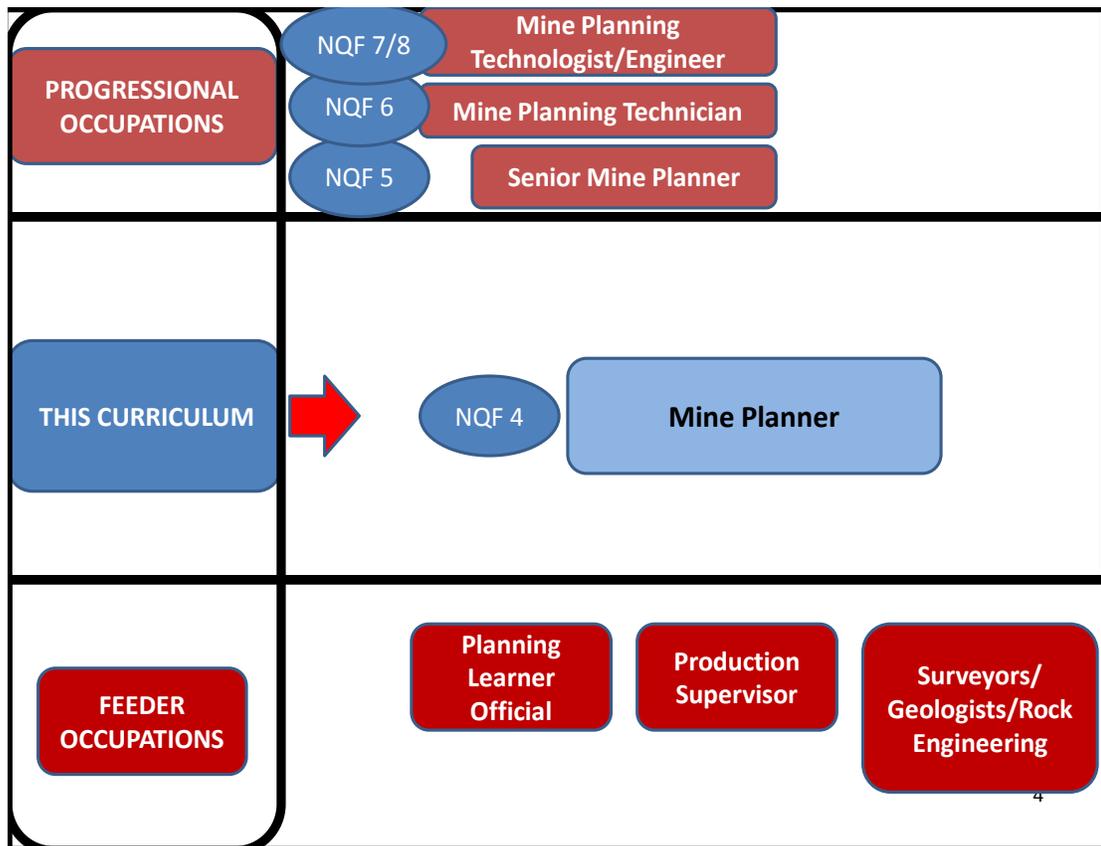
2.2. Occupation or Specialisation addressed by this Curriculum

2.3. Alternative Titles used by Industry

- Junior Mine Planner
- Technical Shift Supervisor
- Shaft Planner
- Designer and Scheduler

3. Curriculum Information

3.1. Relation of this Curriculum to the Occupation and Occupational Progression



DRAFT OCCUPATIONAL CURRICULUM – Mine Planning Officer

3.2. CURRICULUM STRUCTURE – Mine Planning Officer

Number	Title	NQF Level	Credits
KNOWLEDGE SUBJECTS			
311701001-KS-1	Mineral Resource Management	4	36
311701001-KS-2	Mining Engineering Practice	4	13
311701001-KS-4	Operations Management and Supervision	4	4
TOTAL CREDITS FOR KNOWLEDGE		33%	53
PRACTICAL SKILLS			
311701001-PM-1	Producing short and medium term Mineral Extraction layouts and production schedules including resource and equipment requirements for mining final products.	4	20
311701001-PM-2	Preparing and collating information to determine the risks associated with the execution of the short and medium term mine plan	4	4
311701001-PM-3	Analysing production results against planned schedules and recommending corrective action	4	4
311701001-PM-4	Creating operational mining infrastructure and resources schedule	4	4
TOTAL CREDITS FOR PRACTICAL SKILLS		20%	32
WORK EXPERIENCE			
311701001-WM-1	Short and medium term mineral extraction plans and schedules available.	4	75
TOTAL CREDITS FOR WORK EXPERIENCE		47%	75
TOTAL CREDITS FOR THE QUALIFICATION			160

3.3. International Comparability

Countries where similar Qualifications are found	Title of Qualifications	Level	Duration
No comparable qualifications in Mine Planning			

3.4. Entry Requirements

Educational/Physical/Legislative
<ul style="list-style-type: none"> • National Certificate NQF level 4 with Maths and Physical Science; National Foundational Learning Competence. • Successful completion of a pre assessment covering the requirements as specified. (Specify the standard) • Comply with the Mining Industry medical fitness requirements for working in an underground mine.

4. Assessment Quality Partner

Name	Type of Organisation	Contact Details
<ul style="list-style-type: none"> • Involvement of the SAIMM, GSSA, Association of Mine Managers, Colliery Managers Association, Mine Ventilation Society of SA, South African National Institute of Rock Engineers – Lead and Co-ordinated by the MQA taking up all the legal obligations related to this role. 	Formal sub-structure of an Industry Education and Training Authority	

5. Assessment Strategy:

- Computer based written assessments to cover the application of the theory in an integrated manner;
- Candidates complete a prescribed assignment for the specific specialization areas and present it to a panel of assessors at a centralized assessment site. (Two hours presentation and evaluation)

6. Modules of Employable Skills

Modules of Employable Skills		
Employable Skill Number	Title	Credits

Modules of Employable Skill Title:				
Purpose:				
Number of Module	Knowledge Subjects	Practical Skill Module Number	Work Experience Module Number	Credits

Modules of Employable Skill Title:				
Purpose:				
Number of Module	Knowledge Subjects	Practical Skill Module Number	Work Experience Module Number	Credits

SECTION 2: Occupational Profile

Occupational Profile

311701001 - Mine Planner

Occupational Purpose:

Mine Planners: Design and schedule the mineral body to convert the mineral resource into mineral reserves for the safe and profitable extraction of the minerals in line with organisational strategies.

Occupational Tasks:

1. Producing short and medium term Mineral Extraction layouts and production schedules including resource and equipment requirements for mining final products.
2. Preparing and collating information to determine the risks associated with the execution of the short and medium term mine plan.
3. Analysing production results against planned schedules and recommending corrective action.
4. Creating operational mining infrastructure and resources schedules

1. Producing short and medium term Mineral Extraction layouts and production schedules including resource and equipment requirements for mining final products. (NQF Level: 4)

Unique Product or Service

Short and medium term mineral extraction plans and schedules

Knowledge Focus

- Types of applicable mining methods and applications and the key planning principles associated with them (Intermediate)
- Geological structures, stratigraphy and rock groups, deposits and grade distributions of ore bodies and surrounding rock. (Intermediate)
- Concepts and principles of mineral sampling, grade control and mineral quality determination and control (Basic)
- Theories, Techniques and practices used in mine surveying (Layouts, plan reading and interpretation, volumes, sections, trigonometry) (Intermediate)
- Definitions and principles of Geological Modeling and the techniques of interpreting and using these models for mine planning. (Intermediate)
- Principles and application of basic rock engineering as applied to mine design and layouts. (Intermediate)
- Principles and application of mine environmental control as applied to mine planning and the constraints imposed by ventilation on mine planning. (Air flow, volumes, legal requirements, thermal conditions, geo-thermal gradients, occupational health and safety). (Intermediate)
- Principles of applying mine design and scheduling to create a safe and healthy environment. (Intermediate)
- Economic principles behind a profitable mine plan (mineral quality parameters, blending, cut off grade/quality, pay limits, mining width, dilution, recovery, contamination, cost behaviour, definition of profit, product prices and exchange rates) (Intermediate)
- Concepts and principles of integrated mine planning (Advanced)

DRAFT OCCUPATIONAL CURRICULUM – Mine Planning Officer

- Regulatory, compliance and reporting requirements that impact on mine planning (SAMREC code, modifying factors etc.) (Basic)
- Constraints and assumptions that could affect mine planning (Infrastructure, logistics, services) (Advanced)
- Application of mining cycles and how they impact on mine planning (Intermediate)
- Application of mathematical and statistical calculations and analysis as it applies to mine planning. (Intermediate)
- Concepts and principles of meetings and minute keeping within a technical planning environment. (Intermediate)
- Professional standards and protocols for the effective running of a mine planning office. (Intermediate)

Occupational Responsibility

Obtain, interpret and validate the mining production rates, geotechnical information and factors in line with the overall mine strategic plan and statutory requirements. Updated mining layouts to schedule the required resources to achieve the production rates. Scrutinise and maintain the short term production rolling plan. Evaluate and prepare the production plan report and recommend improvements. Coordinate the Mine Planning meetings. Contribute to and participate in the processes of long term business planning. Provide the information for the monthly planning meetings. Record the results of the monthly planning meetings.

Practical Skills

- Use manual methods and electronic planning tools and software to develop mineral extraction layouts and production schedules.
- Read, interpret, interrogate mine and geology plans, sections and schedules.
- Engage with diverse and difficult people regarding technical aspects and influence them to agree on a specific way forward. (Assertiveness)
- Develop a short term and medium term mine layout, plan and schedule

Occupational Context

This task is executed for a designated area of the mine. The task is limited to short term operational and medium term planning. The incumbent uses electronic and/or manual mine planning systems. In executing the task the incumbent will interface with all technical services/MRM staff as well as production supervisors and managers. Operate in accordance with mine best practices and protocols. The scheduling caters for the scheduling of the final product.

Work Experience

- Exposure to the mining value chain.
- Develop short and medium term mine plans covering the key elements of a budget planning cycle. (Monthly plans, six monthly plans and budget plans). Specific to the relevant contexts in underground hardrock mines.

Specific Workplace Knowledge

- Site specific mine standards and codes of practice
- Mine specific business strategy and plan
- Mine specific capacities and constraints
- Mine specific planning processes and protocols.
- Mine Specific Geology (Stratigraphy, rock types, structures)
- Mine and site specific methods, layouts, designs and cycles.

2. Preparing and collating information to determine the risks associated with the execution of the short and medium term mine plan. (NQF Level: 4)

Unique Product or Service

Risk analysis completed

Knowledge Focus

- Concepts and principles of risk management relevant to mine planning. Definitions of risk (Intermediate)
- Concept of feasibility and how this applies to mine planning. (Intermediate)
- Theory of constraints (Basic)
- Principles of cause and effect analysis (Intermediate)

Occupational Responsibility

Evaluate the performance of a designated area of the mine against the mine plans. Collect relevant signed off information from Technical Support Service/MRM department. Make inputs into a process to determine the possible risks: (a. The likely causes impacts and probabilities of the risks. b. Rank and weight the risks. c. Develop actions to prevent the possible causes. d. Develop contingency actions to mitigate the impacts.)

Practical Skills

- Facilitate a process of conducting a qualitative risk assessment on short and medium term mine plans and develop recommend contingency actions. (In collaboration with relevant mining technical functions)
- Develop and make presentations of risks and contingency actions to a diverse group of decision makers and implementers.

Occupational Context

This task is executed for a designated area of the mine. The task is done in collaboration with the Production staff and the Technical Services practitioners.

Work Experience

- Conduct risk assessments on one medium and three short term plans.

3. Analysing production results against planned schedules and recommending corrective action. (NQF Level: 4)

Unique Product or Service

Mine production variance analysis available and actioned.

Knowledge Focus

- Leading practices in mine planning and the evolving role of the mine planner (Basic)
- Concepts, principles and techniques of providing effective advice and support that will be accepted by line management. (Basic)
- Concepts and principles of analytical problem solving and decision making. (Intermediate)
- Concepts and principles of performance management and short interval control. (Intermediate)
- Consequences of not adhering to mine plans (Intermediate)
- Performance standards of a range of mining methods and equipment (Intermediate)
- Concepts and principles of performance management and short interval control. (Intermediate)
- Roles and responsibilities of the mine planner (Intermediate)

Occupational Responsibility

Collect and collate the actual output results. Compare the results to the plan. Analyse the variances and impacts. Plan corrective action. Modify the production schedules and layouts. Coordinate the daily production results and feed it into a manual/electronic reporting system. Extract and distribute relevant reports as required.

Practical Skills

- Analyse performance results against short and medium term mine plans and prepare a report with recommendations for improvement .

Occupational Context

In liaison with production staff.

4. Creating operational mining infrastructure and resources schedules (NQF Level: 4)

Unique Product or Service

Operational mining infrastructure and resources schedule

Knowledge Focus

- Performance factors of equipment and people (capacity, density, air velocities etc.) (Intermediate)
- Life cycle and sequence of creating, building up and maintaining replacement/mineable reserves (Intermediate)

Occupational Responsibility

Analyse the short and medium term mine plans and determine the resource and infrastructure requirements. Define the infrastructure and logistical needs. Determine the availability of existing inventory. Develop infrastructure and resource procurement and allocation schedules and controls.

Practical Skills

- Calculate the resource requirements to capacitate a range of short and medium term mining plans in different situations.

Occupational Context

This task is done for a designated area of a mine. In executing the task the incumbent must interface with Technical Support, Mine stores, mining and engineering. Use is made of project type computer software.

Section 3: Learning Component Specification

3A. Knowledge Subjects

Number	Title	NQF Level	Credits
KNOWLEDGE SUBJECTS			
311701001-KS-1	Mineral Resource Management	4	36
311701001-KS-2	Mining Engineering Practice	4	13
311701001-KS-4	Operations Management and Supervision	4	4
	TOTAL CREDITS FOR KNOWLEDGE	33%	53

311701001-KS-01: Mineral Resource Management

The focus of the learning in this subject is on building an understanding of the theoretical concepts and principles underpinning the data processing requirements of mineral resource management. The learning will enable the learner to manage the various planning processes and solve basic problems relevant to the mine planning processes.

KS01:01. Geological structures stratigraphy, rock groups and deposits of ore bodies and surrounding rock as related to mine planning. (Intermediate) (Credits: 3)

Learning Activity Guidelines:

- Describe the impact of the primary geological features on mine planning; a. Faults (Normal, reverse and thrust); b. Dykes and sills; c. Potholes and sinkholes; d. Joints; e. Bedding planes; f. Ground water; g. Entrapped gasses and fluids; h. Folds
- Identify the various types of geological mineral deposits. b. Bushveld; c. Massive sulphides; d. Iron/manganese; e. Kimberlites; g. Greenstone belt; h. Witwatersrand
- Define the principle rock groups: a. The difference between sedimentary, igneous, and metamorphic rocks; b. Origins of the different rock groups; c. Main rocks found in the different rock groups.
- Explain what stratigraphy means and how it is applied in mines: a. Definition of stratigraphy; b. Relationship between foot wall, hanging wall and mineral deposit.

KS01:02. Concepts and principles of mine sampling and mineral quality determination and control (Intermediate) (Credits: 2)

Learning Activity Guidelines:

1. Describe Terminology used in mine evaluation and how this will impact on mine planning

ASSESSMENT CRITERIA:

1.1 The band width, channel width and mining width is explained in the context of mineral valuation

1.2 The multiple reef types/ bands are explained in the context of mineral valuation

1.3 The meaning and expression of grade, pay-chutes, block value, block width and block call factor are explained in the context of mineral valuation

1.4 The term pay limit and/or cut off grades is explained in the context of mineral valuation

1.5 The meaning of metal accounted for and metal called for and the factors influencing these in terms of MCF, where applicable is explained in the context of mineral valuation

1.6 The terms cmg/t, pgms/t and g/t are explained in the context of mineral valuation

1.7 The meaning of ore dilution and factors influencing this is explained in the context of mining operations

1.8 The difference between ore reserve and ore resource is understood in the context of mining operations

1.9 The typical actions of a supervisor to address a Mine Call Factor problem (real or apparent metal losses) is explained in terms of the relevant site-specific requirements and procedures

2. Explain the typical sampling processes and the flow of sampling information

ASSESSMENT CRITERIA:

2.1 The potential risk associated with inaccurate sampling

2.2 The various sampling methods used are identified and explained in terms of standard sampling methodology and practice

2.3 Quality control measures are applied in accordance with the relevant site-specific quality assurance procedures

2.4. Explain the flow of sampling information.

3. Interpret sampling reports and decide on an appropriate course of action

ASSESSMENT CRITERIA:

3.1 Stopping and development sampling reports are interrogated and deviations identified and reported.

3.2 Geological information given is interpreted from the sampling reports in the context of mine evaluation

3.3 The decisions for Grade and stope width decisions are explained.

3.4 Over and under breaking and cost implications are calculated, considered.

- 3.5 Waste mining recommendations are made in accordance with site-specific requirements
- 3.6 Corrective action is identified in accordance with legal and site-specific requirements.

- 4. Calculate square metres, tons, grade, mineral content and kilograms of metal

ASSESSMENT CRITERIA:

- 4.1 The value for various widths are calculated, given information on widths and grade, channel width and grade and stoping width and grade
- 4.2 Square metres, tons and panel / face kilograms of metal are calculated by means of the standard methods
- 4.3 Recovered kilograms of metal are determined by means of MCF and plant recovery factors
- 4.4 Profit/loss is determined in terms of costs and metal recovered for a particular section of a mine by means of the standard methods of calculation

KS01:03. Theories, Techniques and practices used in mine surveying (Layouts, plan reading and interpretation, volumes, sections, trigonometry) (Intermediate) (Credits: 10)

Learning Activity Guidelines:

- 1. Describe the purpose of surveying and how it is used in the mining industry and how it impacts on mine planning. a. Legal definition of surveying; b. Current leading practices associated with surveying on mines; c. What survey data is used for in the industry. d. Legal requirements for surveying.
- 2. Explain the principles of surveying: a. Need for accuracy in surveying; b. Impact of honesty and integrity on survey results; c. Mathematical applications that apply to surveying; d. Dealing with errors and corrections.
- 3. Describe and give examples of the different types of surveys: a. Cadastral; b. Topographic; c. Hydrographic d. Global positioning; e. mine surveying; f. aerial surveying; g. Trigonometrical; h. Gyro surveying.
- 4. Describe the difference between horizontal, vertical and incline planes a. What the various planes mean; b. Projections between the planes; c. Difference between apparent dips and true dips and strike; d. Relationship between two dimensional and three dimensional views; e. Difference between true north and magnetic north.
- 5. Explain and give examples of the various coordinates and coordinate systems: a. LO systems; b. WGS84; c. Local systems; d. CARTESIAN system - coordinate and direction deviation; e. Difference between the angle of measurement and directions. f. Definition of direction; g. Definition of coordinates; h. Direction and swing when converting from one system

to another.

6. Explain the meaning and application of elevations: a. Origin of mean sea level b. Datum plane; c. Benchmark d. Collar elevation e. Contours

7. Apply the principles of plotting and projection of survey stations on plan and section: a. Scale off bearings/directions with a protractor; b. Establish coordinate lines from plotted survey points/stations and bearing/directions of a line; c. Plotting a survey station/point from known coordinates. d. Projection of survey stations/points. (Describe horizontal, vertical and inclined planes, explain a stope sheet, plot and project a survey stations/points onto a reef plane or mineral bed.

8. Explain by means of example the various techniques of tape surveying and how they are applied. a. Tape trilateration; b. Offsetting; c. Ties. d. Crossing of tapes; e. Principles for locating features.

9. Describe the role of the surveyor and how the survey function interfaces with the planning function.

**KS01:04. Definitions and principles of Geological Modeling and the techniques of interpreting and using these models for planning purposes. (Intermediate)
(Credits: 4)**

Learning Activity Guidelines:

1. Explain how geological models are developed a. Borehole data; b. Use of sampling data; c. Use of geophysical data; d. Use of geological mapping data; e. Techniques of extrapolation and interpretation of the data.

2. Describe how to interpret geological models for planning purposes: a. Effect of structural features; b. Use of three dimensional modeling; c. Effect of primary depositional/formational features and secondary modifications; d. Effect of variations in mineral content. e. Facies and geozones.

3. Describe how the geological models are used to develop mine plans: a. Use of structural features; b. Mineral quality, grade, character/properties and variations; c. Impact of the orientation of rock strata. d. Impact of primary depositional/formational features and secondary modifications. e. Impact of potential geological hazards (water, gases, potholes etc.)

4. Explain variations in confidence in different sampling types. (Representivity of sampling data)

ASSESSMENT CRITERIA:

Using a plan of a geological plan interpret it and describe the impact of the geological conditions on mine planning.

EXTERNAL ASSESSMENT – part of the project

KS01:05. Principles of applying mine design criteria to create a safe and healthy environment. (Advanced) (Credits: 4)

Learning Activity Guidelines:

1. Identify and describe the criteria for a safe, healthy and profitable mining environment: a. Access to the minerals for people, material, equipment and services; b. Transport of minerals, people, material, services and equipment; c. Airflow/ventilation and thermal stress management; d. Rock engineering and strata control; e. De-watering and pumping.
2. Describe the impact of the mineral body characteristics on the basic design of a mine: a. Dip, depth, strike and thickness. a. Geological structures
3. Define the impact of surface infrastructure on basic mine design: a. Electricity, water, communication transport, ecology, topography; b. Ablutions, accommodation, offices and workshops; c. Stockpiles and waste handling; d. Surface boreholes.
4. Explain the various mining authorizations and permits and how they impact on mine design: a. Mining authorisations; b. Environmental permits.

ASSESSMENT CRITERIA:

Using a set of mine design criteria create a mining plan for a given block of ground.

KS01:06. Economic principles behind a profitable mine plan (mineral quality parameters, blending, cut off grade, pay limits, stope width, dilution, recovery, contamination, cost behaviour, definition of profit, product prices and exchange rates) (Basic) (Credits: 2)

Learning Activity Guidelines:

1. Explain the concept of sustained profitability and describe the key mining cost drivers: a. Difference between revenue and profit b. Costs.
2. Describe and explain the impact of: a. mineral quality parameters b. Cut off grade/value, c. pay limits; d. Mining widths, e. Dilution, f. Recovery, g. Mine call factor.

Multiple choice questions

KS01:07. Concepts and principles of integrated mine planning (Advanced)

(Credits: 2)

Learning Activity Guidelines:

1. Describe the Roles and responsibilities of the mine planner; a. Pertaining to the different levels of mine planning; (Facilitation and mediating role) b. Roles within the various mining contexts (Hardrock); c. Collaboration with the other functions (Obtaining buy in for the plan/obtain data for the plan) d. Compliance monitoring and reporting roles.
2. Describe the typical Mine Planning, Design, programming and scheduling processes: a. All key inputs required for planning; b. Which Stakeholders are involved; d. Key assumptions, premises, constraints and limitations regarding mine planning; e. Covers all ore/mineralised and waste material and the relationship between the two.
3. Explain what is meant by mine planning, design and scheduling:
4. Explain the key elements of integrated mine planning.
5. Describe and give examples of the principle purposes and outcomes of the various planning levels a. Long term planning (Scenario planning, Strategic Planning and Life of Mine planning) b. Medium term planning; c. Short term planning.
6. Explain who the typical originators and participants are in the various levels of mine planning.. a. Stakeholders; b. Decision Makers; c. Contributors. d. Explain their various roles.
7. Explain how mine planning fits into the mining value chain.
8. Describe the leading practices in mine planning and the evolving role of the mine planner.
9. Explain the role of Mineral Resource Management: a. Practice of Mineral Resource Management; b. Role of Mine planning within MRM
10. Describe and give examples of the typical roles and responsibilities of the mine planning function: a. Structure and levels of responsibility; b. Lines of communication; c. Key performance indicators. d. Typical mine planning protocols and governance requirements.
11. Describe the concepts and processes of programming and scheduling and give examples of how this applies to integrated mine planning.

Multiple choice questions

KS01:08. Regulatory, compliance and reporting requirements that impact on mine planning (SAMREC code, modifying factors etc.) (Basic) (Credits: 1)

Learning Activity Guidelines:

1. Identify the relevant regulatory requirements for the different mining contexts: a. Various Acts;

- b. Relevant regulations; c. Codes of practice; d. Appropriate Standards, policies and procedures.
2. Explain the purpose and requirements of the SAMREC code.
 3. Describe the relationship between the codes and the mine planning function.
 4. Explain the various modifying and risk factors and how they impact on the planning process.
 - a. Various categories of reserve related risks; b. Need for integrated reporting.

Multiple choice questions

KS01:09. Application of mathematical and statistical calculations and analysis as it applies to mine planning. (Intermediate) (Credits: 3)

Learning Activity Guidelines:

1. Describe the meaning and give examples of the following statistical principles: a. Average, b. Mean, median, mode and frequency (raw data); c. Methods of weighted mean. d. Range
 2. Identify and apply the formulae to calculate: a. Regular and irregular area; b. Volume; c. Densities and tonnage; d. Cut and fill volumes.
 3. Calculate, reconcile and interrogate the tons and content for various mining rock flow networks: a. Format of the Basic Mining equation contextualised for the various mining contexts. (Tabular, Massive and Surface)
-

KS01:10. Concept of feasibility and how this applies to mine planning. (Intermediate) (Credits: 1)

Learning Activity Guidelines:

1. Explain what is meant by feasibility: a. Meeting the constraints of the mineral body; b. Limitations of the mining layout geometry; c. Within the limitations of prevailing economic circumstances (Profitable or not)
 2. Explain how the concept of feasibility apply to mine planning.
-

KS01:11. Life cycle and sequence of creating, building up and maintaining replacement/mineable reserves (Advanced) (Credits: 4)

Learning Activity Guidelines:

1. Describe the process required to create a minable reserve: a. Movable reserves as it pertains to mine planning.
2. Describe the sequence of creating a mineable face: a. Iceberg type models; b. Mining life cycle; c. Face length management.
3. Identify and explain the constraints that must be considered when planning the mining life cycle. a. describe the relative amounts of work required to complete the cycle. b. Implications related to the different mining contexts.
4. Calculate the replacement rates for various mining operations. a. Use specific performance standards b. State and explain the various performance standards
5. Explain the impact of strategic execution strategies on the life cycle sequence of creating, building up and maintaining replacement/mineable reserves

Total Credits: 36

Exemptions

Qualification or Learning programs that can give you exemption for this Module:

Number	Title	Institution	NQF Level
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Provider Accreditation Requirements:

Human Resources

- Facilitators of learning for this subject should have a Mining Engineering, Survey, Geology or Mineral Resource Management or another relevant technical Mining qualification at least at NQF level 6 or higher;
- Facilitators must have at least five years relevant post qualification operational experience on an underground Hardrock Mine;
- Facilitators must be technical experts in the various sub field of Mineral Resource management to conduct the training and ensure ongoing relevance of the material;
- Facilitator/Learner ratio should not exceed 1:20

Physical Resources

- The learning is conducted in a normal lecture environment with no specific equipment or tools. Facilitators must have access to mine and geological plans and a range of relevant rock samples.
- Meet the relevant accreditation requirements set by the assessment Quality Partner

regarding record keeping, assessors and moderation.

Safety, Health and Environment

- Compliance with the normal Occupational Health and safety requirements

311701001-KS-2: Mining Engineering Practice

KS02:01. Types of mining methods and applications and the key planning principles associated with them (Intermediate) (Credits: 4)

Learning Activity Guidelines:

1. Explain the methodology associated with a range of mining methods: a. Shallow, intermediate and deep tabular mining; b. Massive mining; c. Mechanised hardrock mining; d. Underground coal; e. Surface mining.
2. Explain the circumstances when the different mining methods are applicable a. Depth; b. Dip; c. Size and shape of the mineral body; d. Geological and geotechnical characteristics; e. Typical criteria for selecting various mining methods.
3. Identify and explain the different planning priorities and parameters associated with each mining method. a. Development requirements; b. Access requirements; c. Preparation and equipping requirements; d. Provisioning of mining production services; e. Requirements for mineral extraction; f. Handling of broken rock.
4. Explain the impact of mechanisation on mine design, planning and operation. a. Focus on machine, needs, size and capability rather than manual labour; b. Economic principles of mechanised equipment; c. Changes in layouts caused by mechanisation. d. Performance standards for the various mechanised mining equipment.
5. Describe the application of mining cycles relevant to each of the mining methods and how this impacts on mine planning. a. Conventional mining (Covers the cyclical process) b. Mechanised mining (Capacities and use of the equipment and how to avoid bottlenecks) c. Surface mining (Impact of seasons etc.) d. Difference between explosive based and non explosive based mining cycles. e. Use of multi blast cycles per shift. f. Consequences of changes to the mining cycles. g. Relevant calculations pertaining to mining cycles.
6. Explain the need for determining the performance capacity of the various mining equipment and resources: a. Types of capacities; b. Impact of differing capacities on mine planning; c. Sources of the various capacities; d. Acceptable performance indicators; e. Typical calculations of performance indicators using historical information. f. Expected productivity indicators for the various mining situations (tons per employee/shift, mechanisation shift times) g. Use of a standard set of assumptions, premises and constraints regarding performance standards.

THEORY ASSESSMENT

Total Credits: 4

Provider Accreditation Requirements:

Human Resources

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Physical Resources

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- Meet the relevant accreditation requirements set by the assessment Quality Partner regarding record keeping, assessors and moderation.

Safety, Health and Environment

- Compliance with the normal Occupational Health and safety requirements.

Exemptions

Qualification or Learning programs that can give you exemption for this Module:

Number	Title	Institution	NQF Level
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311701001-KS-3: Mining Technical Services Practice

KS03:01. Principles and application of basic rock engineering as applied to mine design

and layouts. (Intermediate) (Credits: 4)

Learning Activity Guidelines:

1. Explain what is meant by Rock Engineering and what the study field consists of:
 - **RANGE:** a. Differentiate between rock engineering, strata control, seismicity and slope stability.
2. Explain the definitions of the basic Rock Engineering Terminology:
 - **RANGE:** Mass. Gravity. Weight. Stress (virgin, induced, field, compression, tensile, shear). Strain. Deformation. Rock strength. UCS. Elasticity. Convergence. Closure. Fracture zone. Seismic event. Rock burst. Poisson's ratio. Displacement. K-ratio.
3. Explain the basic Rock Engineering principles and indicate how they impact on mine design and scheduling:
 - **RANGE:** a. Spacings, Approaching geological discontinuities, face shapes, sequencing; destressing; midlings; types of pillars; rock strength and other relevant factors and principles.
4. Explain the basics of strata control: a. Support requirements; b. Affect of geological features; closure, basic rock mass response; geotechnical zones/areas; regional vs local support; Size and proximity of excavations;
5. Describe the impact of Rock Engineering on the selection of applicable mining methods; (sequential grid, Longwall, scattered mining; Room and pillar)
6. Describe the impact of various types of support on logistical requirements.

KS03:02. Principles and application of mine environmental control as it pertains to mine planning . (Basic) (Credits: 1)

Learning Activity Guidelines:

1. Describe the need for ventilation in a mine: a. Definition of ventilation; b. Consequences of poor ventilation.
2. Describe the main mine design considerations required for ventilating a mine;
3. Explain the relationship between heat and depth of mining and how this impacts on mine planning.
4. Explain the impact of the introduction of backfilling on mine design;
5. Explain the concept of ventilation districts and basic air flow strategies;

KS03:03. Constraints and assumptions that could affect mine planning (Infrastructure, logistics, services) (Advanced) (Credits: 3)

Learning Activity Guidelines

1. Explain what a constraint is and how constraints impact on mine planning. a. Identify typical constraints;
2. Describe the procedure to identify constraints in a processes, determine the impact of the

constraints and develop actions to deal with the constraints. (Draw a basic constraint diagramme)

3. Identify and describe the infrastructure constraints on mine planning; a. Mine access positioning relative to mineral body and capacities; b. Traveling time and distance; c. Effective shift times and cycles; d. Effective access to working areas; e. Second outlets and escape routes; f. Surface layouts; g. Positioning and capacity of beneficiation plants; h. Changing character of mineral body; i. Surface structures and restricted areas.

4. Identify and describe the constraints and assumptions related to logistics (movement of people, material and rock): a. Hoisting capacity; b. Trimming distance and capacity; c. Storage and stockpiling capacities; d. Rock fragmentation and water content; e. Transport methods; f. Relative capacities of the various ways of moving rock/people/material/equipment; g. Production efficiency assumptions. h. Material handling processes; i. Mining Method; j. Support Method.

5. Identify and describe the constraints and assumptions related to mining services: a. Various energy sources and supply; b. Provisioning, removal and treatment of water (all types); c. Ventilation, occupational environmental and climate control; d. Sanitation; e. Engineering and maintenance services; e. Dewatering and cover drilling.

6. Identify and describe the constraints and assumptions related to integrated environmental management: a. Pollution (Hazardous substances, Dust, gas, noise and visual); b. Rehabilitation; c. Waste dump/stock pile placement, design and management; d. Climate and weather.

7. Identify and describe the impact of all the constraints on the occupational health and safety issues that must be planned for.

KS03:04. Performance factors of equipment and people (capacity, density, air velocities etc.) (Intermediate) (Credits: 1)

Learning Activity Guidelines:

1. Describe the physical constraints of mining environments on the efficient functioning of a human being: a. Heat and heat fatigue; b. Effective shift times; c. Consequences of shift cycles on rest periods and how it impacts on work performance.

2. Describe and give examples of typical lead times for the procurement of people and equipment and how this will impact on mine planning a. Availability of equipment and people; b. Procurement and delivery times; c. Ramp up times for making people fully productive; d. Equipment commissioning requirements.

3. Explain the consequences of the impact of distances from the mine access on performance standards and the implications of this for mine planning.

Total Credits: 10

Provider accreditation requirements

Human Resources

- Facilitators of learning for this subject should have a Mining Engineering, Survey, Geology or Mineral Resource Management or another relevant technical Mining qualification at least at NQF level 6 or higher;
- Facilitators must have at least five years relevant post qualification operational experience on an underground Hardrock Mine;
- Facilitators must be technical experts in the various sub field of Mineral Resource management to conduct the training and ensure ongoing relevance of the material;
- Facilitator/Learner ratio should not exceed 1:20

Physical Resources

- The learning is conducted in a normal lecture environment with no specific equipment or tools. Facilitators must have access to mine and geological plans and a range of relevant rock samples.
- Meet the relevant accreditation requirements set by the assessment Quality Partner regarding record keeping, assessors and moderation.

Safety, Health and Environment

Compliance with the normal Occupational Health and safety requirements

Exemptions

Qualification or Learning programs that can give you exemption for this Module:

Number	Title	Institution	NQF Level
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311701001-KS-4: Operations Management and Supervision

KS04:01. Concepts and principles of meetings and minute keeping within a technical

planning environment. (Intermediate) (Credits: 1)

Learning Activity Guidelines:

1. Explain the purpose, structure and dynamics of technical planning meetings: a. Multi disciplinary meeting; b. Role players in the meetings and their functions; c. Need for proper record keeping and the consequences of not having proper records; d. Process of communicating meeting results. e. Consequences of ineffective communication.
 2. Explain how the results of planning meetings and decisions must be followed up to ensure execution.
 3. Explain the importance of proper preparation for planning meetings and the consequences of poor preparation.
 4. Describe the typical short and medium term mine planning processes/cycles and indicate the typical role of the mine planner in these processes.
-

KS04:02. Concepts and principles of risk management relevant to mine planning. (Intermediate) (Credits: 1)

Learning Activity Guidelines:

1. Explain what is meant by risk management as it pertains to mine planning and design: a. Concept of risk b. Principle areas of risk in mine planning; c. Level or significance of the risks.
 2. Identify the key occupational health and safety aspects that must be built into the mine plans.
 3. Describe the process for determining the risks associated with the achievement of the mine plan: a. Level of confidence of a mine plan; b. Residual risks associated with a mine plan; c. Consequences of significant risks; d. Typical actions within the control of the mine planner to mitigate the risks associated with the delivery of the plan.
-

KS04:03 Consequences of not adhering to mine plans (Intermediate) (Credits: 1)

Learning Activity Guidelines:

1. Explain the need for continually monitoring compliance with the mine plans
2. Explain and give examples of the impact of non adherence to the mine plan on the mining business
3. Identify possible actions to mitigate the impact of non compliance with mine plans

Total Credits: 4

Exemptions

Qualification or Learning programs that can give you exemption for this Module:

Number	Title	Institution	NQF Level
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Provider accreditation requirements

Human Resources

- Facilitators of learning for this subject should have a Mining Engineering, Survey, Geology or Mineral Resource Management or another relevant technical Mining qualification at least at NQF level 6 or higher;
- Facilitators must have at least five years relevant post qualification operational experience on an underground Hardrock Mine;
- Facilitators must be technical experts in the various sub field of Mineral Resource management to conduct the training and ensure ongoing relevance of the material;
- Facilitator/Learner ratio should not exceed 1:20

Physical Resources

- The learning is conducted in a normal lecture environment with no specific equipment or tools. Facilitators must have access to mine and geological plans and a range of relevant rock samples.
- Meet the relevant accreditation requirements set by the assessment Quality Partner regarding record keeping, assessors and moderation.

Safety, Health and Environment

Compliance with the normal Occupational Health and safety requirements

3B Practical Skills Modules

Number	Title	NQF Level	Credits
PRACTICAL SKILLS			
311701001-PM-1	Producing short and medium term Mineral Extraction layouts and production schedules including resource and equipment	4	20

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	requirements for mining final products.		
311701001-PM-2	Preparing and collating information to determine the risks associated with the execution of the short and medium term mine plan	4	4
311701001-PM-3	Analysing production results against planned schedules and recommending corrective action	4	4
311701001-PM-4	Creating operational mining infrastructure and resources schedule	4	4
TOTAL CREDITS FOR PRACTICAL SKILLS		20%	32

311701001-PM-01: Producing short and medium term Mineral Extraction layouts and production schedules including resource and equipment requirements for mining final products. (NQF Level:4)

Scope of the Module

The purpose of this module is to provide learners an opportunity to practice the skills required to produce short and medium term mineral extraction plans.

PM01:01. Manually Develop a short term and medium term mine layout, plan and schedule (Credits: 16)

Learning Activity Guidelines:

Given a geological structural plan and a geological resource model as well as a list of planning and performance parameters/assumptions. Be able to:

1. Sort, collate the provided information and generate assumptions where needed to deal with the relevant constraints.
2. Create a mining layout based on an agreed mining design (Including development and stope/section)
3. Programme the required mining operations in accordance with the pre-established outcomes and the potential capability of the given resource.
4. Develop detailed production schedules to achieve the mining programme. (Including both development, production and reclamation)
5. Calculate the results of the schedule into a basic mining equation/mineral flow.
6. Evaluate the outcome of the plan against the top down goals and identify and explain the reasons for not achieving the goals and indicate what could be done to get closer to the goals.

5. Produce a report summarizing the results of the planning exercise

Guidelines for assessment:

1. APPLIED KNOWLEDGE: Test understanding of: a. Concepts, process and principles of planning, programming and scheduling; b. Application of mining/production cycles on planning; c. Implications of the relevant constraints.
2. Observe the extent to which the learner has followed the generic procedure for compiling layouts, plans and schedules and interpreting the geological model.
3. Evaluate the Final layout and schedule and report to determine: a. That the layout is practically fit to the given geological conditions; b. Practicality of the sequencing/programming; c. Accuracy of the calculated results; d. The achievability of the plan. e. The integrity of all the assumptions used in the plan. f. Validity of the reasons for non compliance with top down goals.

PM01:02. Read, interpret, interrogate mine and geology plans, sections and schedules. (Credits: 4)

Learning Activity Guidelines:

Given a completed mine, survey and geological plan, a plan of specific workings (stope sheet as well as production plans and results and relevant services department reports for a work area.

Be able to:

1. Calculate volumes, tonnes, and face advance (distances) using the mine plan.
2. Plot and update the section plan with the production information
3. Interpret the geology plans and describe the implications of the conditions on the mine plan related to the specific working area in terms of safety, production and cost.
4. Identify and describe: a. All geological features indicated on the plan; b. all infrastructures indicated on the plan; c. Identify the direction and coordinates on the plan d. Distinguish the elevation and gradient (dip and strike) e. Identify the boundaries and pillars f. Identify the types of excavations (shafts, sub shafts, drives cross-cuts, drives, traveling ways. g. Identify the position of survey pegs and stations. h. Identify restricted areas and abandoned workings. i. Identify all dams. j. Lines indicating the planes of sections; k. Water plugs l. Falls of ground. m. Ventilation districts. n. Harmful gas intersections. o. Economically mineable areas. p. Legends and schedules.
5. Identify and describe possible areas where the current planning can be improved.

Guidelines for assessment:

1. APPLIED KNOWLEDGE: Test understanding of the concepts and principles of mine survey. (a. Definition and purpose of the different types of mine plans (1:1000, 1:1500, 1:5000, 1:10000, 1:200), b. Legal requirements covered on the various mine plans (including survey notes, holing notes, start up notes. c. Plan layout and all symbols and signage used on mine plans d. Implication of non adherence to requirements on mine plans
2. Evaluate that all features and orientations on the various plans are correctly identified and described. (Features as indicated on the plans)
3. Evaluate the accuracy of the interpretation and ensure that all implications related to safety,

production and cost have been identified and correctly described.

4. Observe the process of plotting and updating the plan checking accuracy, neatness and completeness.

5. Evaluate that all calculations are correctly done.

6. Evaluate that the appropriate improvements have been identified and reasonable improvement actions identified.

6. Construct sections across the plan;
7. Construct development layouts for these sections (Boxholes, crosscuts, raises and connections)
8. Calculate volumes, areas and tonnages of these various layouts

Total Credits: 20

Provider Accreditation Requirements:

Human Resources

- Facilitators of learning for this module should have a Mining Engineering, Survey, Geology or Mineral Resource Management or another relevant technical Mining qualification at least at NQF level 6 or higher;
- Facilitators must have at least five years relevant post qualification operational experience on an underground Hardrock Mine;
- Facilitators must be technical experts in the various sub field of Mineral Resource management to conduct the training and ensure ongoing relevance of the material;
- Facilitators/assessor of learning for this module must have at least five years experience as a Mine Planner in the relevant mining environment.
- Facilitator/Learner ratio should not exceed 1:15

Physical Resources

- The learning is conducted in a normal lecture environment with no specific equipment or tools. Facilitators must have access to mine and geological plans and a range of drafting equipment;
- Meet the relevant accreditation requirements set by the assessment Quality Partner regarding record keeping, assessors and moderation.

Safety, Health and Environment

- Compliance with the normal Occupational Health and safety requirements

311701001-PM-2: 2. Preparing and collating information to determine the risks associated with the execution of the short and medium term mine plan. (NQF Level:4)

Scope of the Module

PM02:01. Facilitate a process of conducting a qualitative risk assessment on short term mine plans and develop recommend contingency actions. (In collaboration with relevant mining technical functions) (Credits: 4)

Learning Activity Guidelines:

Given a mine plan with various risks, the parameters used for the plan, geological models and plans and scenarios of the mining operations with the recent performance results. Be able to:

1. Identify the risks associated with the inputs to the plan (Geological, geotechnical, mining parameters, assumptions)

Identify all the risks associated with the execution of the plans.

2. Prioritise the risks as high, medium and low and specify the significant risks.
3. Identify the occupational health and safety risks associated with the execution of the plan.
4. Prioritise the Occupational Health and Safety risks and determine the significant Occupational Health and safety risks.
5. Identify the possible actions to mitigate the identified significant risks.
6. Develop and make presentations of risks and contingency actions to a diverse group of decision makers and implementers.

Guidelines for assessment:

1. APPLIED KNOWLEDGE: Test understanding of: a. Basic concepts of risk in planning; b. Process of the risk identification process.
2. Evaluate the identified risks and the suggested mitigating actions: a. Significant risks identified; b. Practicality and feasibility of the suggested mitigating actions.

3. Evaluate the use of appropriate presentation skills and communication behaviours in presenting the risk assessment.

Total Credits: 8

Provider Accreditation Requirements:

Human Resources

- Facilitators of learning for this module should have a Mining Engineering, Survey, Geology or Mineral Resource Management or another relevant technical Mining qualification at least at NQF level 6 or higher;
- Facilitators must have at least five years relevant post qualification operational experience on an underground Hardrock Mine;
- Facilitators must be technical experts in the various sub field of Mineral Resource management to conduct the training and ensure ongoing relevance of the material;
- Facilitators/assessor of learning for this module must have at least five years experience as a Mine Planner in the relevant mining environment.
- Facilitator/Learner ratio should not exceed 1:15

Physical Resources

- The learning is conducted in a normal lecture environment with no specific equipment or tools. Facilitators must have access to mine and geological plans and a range of drafting equipment;
- Meet the relevant accreditation requirements set by the assessment Quality Partner regarding record keeping, assessors and moderation.

Safety, Health and Environment

- Compliance with the normal Occupational Health and safety requirements

311701001-PM-03: Analysing production results against planned schedules and recommending corrective action. (NQF Level:4)

Scope of the Module

PM03:01. Analyse performance results against mine plans and prepare a report with

improvement recommendations. (Credits: 4)

Learning Activity Guidelines:

Given various mine plans, targets and mining parameters as well as the production results and reports from various service departments for mining operations. Be able to:

1. Review the recent history of production areas and identify the non compliance issues and/or critical repeat issues that impact on the achievement of the mine plan. Also take cognizance of any changed instructions coming from service departments (Grade/product quality control, geological information, rock engineering etc.)
2. Review the assumptions made in the plan and where necessary change the assumptions for the next production period.
3. Redo the existing plan using the amended assumptions and compare it with the production budget;
4. Make recommendations of how to come back to achieving the budget.
5. Present, motivate and sell the recommendations to decision makers.

Guidelines for assessment:

1. APPLIED KNOWLEDGE: Test understanding of: a. Principles of statistical analysis and interpretation; b. Mining value chain and applicable constraints; c. Factors that can impact on mining.
2. Observe the appropriate use of presentation techniques and interpersonal behaviours in obtaining buy in for recommendations.
3. Evaluate the analysed results and check that all critical issues was identified
4. Evaluate the validity and practicality of the recommendations

Total Credits: 4

Provider Accreditation Requirements:

Human Resources

- Facilitators of learning for this module should have a Mining Engineering, Survey, Geology or Mineral Resource Management or another relevant technical Mining qualification at least at NQF level 6 or higher;
- Facilitators must have at least five years relevant post qualification operational experience on an underground Hardrock Mine;
- Facilitators must be technical experts in the various sub field of Mineral Resource management to conduct the training and ensure ongoing relevance of the material;
- Facilitators/assessor of learning for this module must have at least five years experience as a Mine Planner in the relevant mining environment.
- Facilitator/Learner ratio should not exceed 1:15

Physical Resources

- The learning is conducted in a normal lecture environment with no specific equipment or tools. Facilitators must have access to mine and geological plans and a range of drafting equipment;
- Meet the relevant accreditation requirements set by the assessment Quality Partner regarding record keeping, assessors and moderation.

Safety, Health and Environment

- Compliance with the normal Occupational Health and safety requirements

311701001-PM-04: Creating operational mining infrastructure and resources schedules (NQF Level:4)

Scope of the Module

PM04:01. Calculate the resource requirements to capacitate a range of short and medium term mining plans in different situations. (Credits: 4)

Learning Activity Guidelines:

Given a range of different mining situations, mine plans, mining parameters, performance criteria, available resources and required resource specifications. Be able to:

1. Create a detailed schedule, appropriate to the mining activities, for each of the mining activities required in the production period. (daily, weekly, monthly etc)
2. Create a detailed list of all equipment and material required to achieve the production results.
3. Determine how the material and equipment will be sourced and how it will be brought onto site timeously;
4. Compile a Human Resource plan to achieve the production targets;

Guidelines for assessment:

1. APPLIED KNOWLEDGE: Test understanding of: a. Concepts and principles of productivity and efficiency; b. Process of resourcing and scheduling; c. Inter dependencies of the various disciplines.
2. Evaluate the compiles schedules and check that: a. They are comprehensive; b. Schedules are adequately integrated and synchronised. c. The extent to which it meets the budget requirements.

Total Credits: 4

Provider Accreditation Requirements:

Human Resources

- Facilitators of learning for this module should have a Mining Engineering, Survey, Geology or Mineral Resource Management or another relevant technical Mining qualification at least at NQF level 6 or higher;
- Facilitators must have at least five years relevant post qualification operational experience on an underground Hardrock Mine;
- Facilitators must be technical experts in the various sub field of Mineral Resource management to conduct the training and ensure ongoing relevance of the material;
- Facilitators/assessor of learning for this module must have at least five years experience as a Mine Planner in the relevant mining environment.
- Facilitator/Learner ratio should not exceed 1:15

Physical Resources

- The learning is conducted in a normal lecture environment with no specific equipment or tools. Facilitators must have access to mine and geological plans and a range of drafting equipment;
- Meet the relevant accreditation requirements set by the assessment Quality Partner regarding record keeping, assessors and moderation.

Safety, Health and Environment

- Compliance with the normal Occupational Health and safety requirements

3C. Work Experience Modules

WORK EXPERIENCE			
311701001-WM-1	Short and medium term mineral extraction plans and schedules available.	4	75
TOTAL CREDITS FOR WORK EXPERIENCE		47%	75

311701001-WM-1: Short and medium term mineral extraction plans and schedules available. (NQF Level:4)

Purpose of the Module

WM01:01. Exposure to the mining value chain. (Credits: 32)

Scope of work activities:

1. **MINE SURVEY:** a. Take measurements of various mining operations. b. Observe the installation of survey stations; c. Exposed to the creation and updating of statutory mine plans (Maps) d. Exposed to the measurement and calculation of mineral flow and grade control. e. Exposure to the communication documentation required for legal compliance(10 Shifts)
2. **MINE PRODUCTION ACTIVITIES:** a. Observe the execution of the production activities in actual production environments b. Exposed to a range of difficulties and constraints when executing the production sequence in the various mining activities. c. Participate in the daily reviews of the achievement of production targets. (10 Shifts)
3. **ENGINEERING:** a. Observe the implementation of planned maintenance for various mining equipment and services; b. Be exposed to the major mining infrastructure installations; c. Observe the total mineral flow process (2 Shifts)
4. **MINERAL BENEFICIATION:** a. Exposure to the mineral processing operations; b. Observe the waste management processes; c. Observe the stockpiling and blending operations; d.

Exposure to the mineral accounting and control processes (2 Shifts)

5. SAFETY HEALTH AND ENVIRONMENTAL MANAGEMENT: a. Observe the execution of a mine ventilation survey; b. Exposed to the emergency response and Rescue processes. (2 Shifts)

6. ROCK ENGINEERING: a. Exposed to the strata analysis processes (Measurements of stresses and strains) b. Observe the installation of various types of support; c. Observe the strata control monitoring and reporting processes; d. Exposed to the computer based Rock Engineering modeling processes. (5 Shifts)

7. SAMPLE COLLECTION AND ANALYSIS a. Observe the process of collecting and processing samples; b. Exposure to the sample analysis processes; c. Exposure to the sample result processing and reporting. (3 Shifts)

8. GEOLOGY: a. Observe the process of geological mapping for different mining activities; b. Observe the process of borehole logging; c. Observe the preparation and updating of geological plans/maps; d. Exposed to the process of the development of geological models; e. Observe the development of the mineral resource model. (6 Shifts)

9. MINE PLANNING INFORMATION SYSTEM: a. Input raw data and utilise the data to produce plans, reports and schedules using the mine specific planning tools.

WM01:02. Develop short term mine plans covering the key elements of a budget planning cycle. (Monthly plans, six monthly plans and budget plans). Specific to the relevant context (UG Hardrock or Surface Mining or Underground Coal.) (Credits: 80)

Scope of work activities:

1. Obtain, interpret and validate the mining production rates, geotechnical information and factors in line with the overall mine strategic plan and statutory requirements.
2. Updated mining layouts to schedule the required resources to achieve the production rates.
3. Scrutinise and maintain the short term production rolling plan.
4. Evaluate and prepare the production plan report and recommend improvements.
5. Coordinate the Mine Planning meetings.
6. Contribute to and participate in the processes of the medium and long term business planning.
7. Provide the information for the monthly planning meetings.
8. Record the results of the monthly planning meetings.

Total Credits: 75

Exemptions

Qualification or Learning programs that can give you exemption for this Module:

Number	Title	Institution	NQF Level
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Contextualised Workplace Knowledge Required

Mine specific business strategy and plan

Mine specific capacities and constraints

Mine specific planning processes and protocols.

Site specific mine standards and codes of practice

Guidelines for assessment:

Planning parameters are collected and communicated clearly, accurately.

Mining assumptions used are accurate and realistic

Mine plans produced are defensible and in line with the company strategy.

Deviations from top down goals are adequately motivated and justified.

Plans are realistic and accepted by line management

Deadlines are achieved on an ongoing bases

Work is done in a collaborative way and communications to other role players are clear.

Residual risks are adequately identified and communicated.

Workplace Resources Required

Human Resources

The workplace must be a bona fide underground hardrock mining operation with the relevant departments and Human Resources as required to give the learner the exposure set out in this module.

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Physical Resources

All standard equipment and facilities required by to enable the learner to execute the work as set out in this module must be available.

Safety, Health and Environment

Compliance with all regulatory requirements.

Work Experience Record – Mine Planner

Curriculum Number:	311701001
Curriculum Title:	Mine Planner
Description:	Tests new and existing engineering technologies relating to the location and extraction of minerals from the earth and oversees the safety of mining operations and supervises miners

Learner Details:

Name:	
ID Number:	

Confirmation of Work Experience

Work Experience	Credits	Date	Signature
311701001-WM-1 - Short and medium term mineral extraction plans and schedules available.. (Credit: 112)			
Exposure to the total mining value chain. 1. MINE SURVEY: a. Take measurements of various mining operations. b. Observe the installation of survey stations; c. Exposed to the creation and updating of statutory mine plans (Maps) d. Exposed to the measurement and calculation of mineral flow and grade control. e. Exposure to the communication documentation required for legal compliance(10 Shifts)	32		

<p>2. MINE PRODUCTION ACTIVITIES: a. Observe the execution of the production activities in actual production environments b. Exposed to a range of difficulties and constraints when executing the production sequence in the various mining activities. c. Participate in the daily reviews of the achievement of production targets. (10 Shifts)</p> <p>3. ENGINEERING: a. Observe the implementation of planned maintenance for various mining equipment and services; b. Be exposed to the major mining infrastructure installations; c. Observe the total mineral flow process (2 Shifts)</p> <p>4. MINERAL BENEFICIATION: a. Exposure to the mineral processing operations; b. Observe the waste management processes; c. Observe the stockpiling and blending operations; d. Exposure to the mineral accounting and control processes (2 Shifts)</p> <p>5. SAFETY HEALTH AND ENVIRONMENTAL MANAGEMENT: a. Observe the execution of a mine ventilation survey; b. Exposed to the emergency response and Rescue processes. (2 Shifts)</p> <p>6. ROCK ENGINEERING: a. Exposed to the strata analysis processes (Measurements of stresses and strains) b. Observe the installation of various types of support; c. Observe the strata control monitoring and reporting processes; d. Exposed to the computer based Rock Engineering modeling processes. (5 Shifts)</p> <p>7. SAMPLE COLLECTION AND ANALYSIS a. Observe the process of collecting and processing samples; b. Exposure to the sample analysis processes; c. Exposure to the sample result processing and reporting. (3 Shifts)</p> <p>8. GEOLOGY: a. Observe the process of geological mapping for different mining activities; b. Observe the process of borehole logging; c. Observe the preparation and updating of geological plans/maps; d. Exposed to the process of the development of geological models; e. Observe the development of the mineral resource model. (6 Shifts)</p> <p>9. MINE PLANNING INFORMATION SYSTEM: a. Input raw data and utilise the data to produce plans, reports and schedules using the mine specific planning tools.</p>			
<p>Develop short term mine plans covering the key elements of a budget planning cycle. (Monthly plans, six monthly plans and</p>	<p>43</p>		

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budget plans). Specific to the relevant context (UG Hardrock or Surface Mining or Underground Coal.)

1. Obtain, interpret and validate the mining production rates, geotechnical information and factors in line with the overall mine strategic plan and statutory requirements.
2. Updated mining layouts to schedule the required resources to achieve the production rates.
3. Scrutinise and maintain the short term production rolling plan.
4. Evaluate and prepare the production plan report and recommend improvements.
5. Coordinate the Mine Planning meetings.
6. Contribute to and participate in the processes of the medium and long term business planning.
7. Provide the information for the monthly planning meetings.
8. Record the results of the monthly planning meetings.

TOTAL CREDITS: 112

Employer Details:

Company Name:

Physical Address:

Tel:

E-Mail:

Supervisor:

Occupational Outcomes to be Externally Assessed

External Assessment Specification				
Occupational Outcome	Area to be Assessed	Assessment Criteria	Assessment Method	Weight

