



National Vocational Certificate Level 3 in Mining Process Technology (Technician)

**National Vocational Certificate Level 2 in Mining Process Technology
(Assistant Technician)**



(Curriculum)

National Vocational and Technical Training Commission (NAVTTC) Government of Pakistan



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Introduction

Definition/Description of training program (Technician)

Mining sector is one of the booming industries of Pakistan. There is an increasing demand of the Mining Technician. Therefore, the skills are required to be inducted in the future generation. If an individual is planning to pursue a career in mining, this program will be helpful in targeting various commercial and noncommercial projects etc. If an individual is planning to take up Technician course, this course will help him weigh their choices better.

Keeping in view of the above the competency based national vocational qualifications have been developed by NAVTTTC to train the unskilled human resource on the technical and entrepreneurial skills to be employed / self-employed and inevitably set sustainable impact on their lives by increasing their livelihood income.

Training Course is based on competency standards which are defined by the industry and the traditional role of a trainer changes and shifts towards the facilitation of training. A trainer encourages and assists trainees to learn for themselves. Trainees are likely to work in groups (pairs) and all doing something different. Some are doing practical tasks in the workshop, some writing, some not even in the classroom or workshop but in another part of the building using special equipment. As trainees learn at different pace they might be at different stages in their learning, thus learning must be tailored to suit individual needs.

The following facilitation methods (teaching strategies) are generally employed.

Purpose of the training program:

Pakistan is rich in mineral resources, with significant deposits of copper and gold in Reko Diq, marble in Buner and Mohmand, and rare earth elements found in various regions of Khyber Pakhtunkhwa and Baluchistan. These natural assets offer immense economic potential, but their effective development requires a skilled and competent workforce. This Level-3 course is designed to prepare technicians with the essential knowledge and practical skills needed to support modern mining operations. By focusing on safe, efficient, and sustainable practices, the program



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aims to produce professionals who can contribute to the responsible extraction and processing of the country's valuable mineral resources, ensuring long-term growth of the mining sector.

For this purpose, new qualifications have *been* developed by NAVTTC on CBT&A mode in order to train the unskilled human resource with employable skills and cater to the demand of both domestic and international market in minerals and mine sectors. Moreover, the availability of skilled professionals will bring socio-economic benefits to all stakeholders.

Overall objectives of training program:

The main objectives of the National Vocational Certificate Level 3 in Mining Process Technology (Technician) are as follows:

- Develop essential technical skills required for core mining operations.
- Ensure safety compliance through proper knowledge of site safety protocols.
- Gain competence in blasting and drilling techniques critical for mining efficiency.
- Learn to operate and manage conveyors, a key aspect of material handling in mines.
- Enhance communication skills for effective team coordination and reporting.
- Build proficiency in basic computer and 2D drawing tools for mining-related documentation and planning.
- Understand and apply inventory management practices for mine materials and equipment.
- Prepare for entry-level technician roles in the mining and mineral sector.
- Improve decision-making by integrating technical, digital, and practical knowledge.
- Lay a strong foundation for further specialization or supervisory roles in the mining industry.

Competencies to be gained after completion of course:

At the end of the course, the trainee would attain the following core competencies:

1. Maintain Safety at Site



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2. Perform Basic communication skills
3. Perform Core Drilling for Mining
4. Perform Blasting Operation
5. Perform Conveyor Operations
6. Perform Basic Computer Operations
7. Develop 2D drawings
8. Manage inventory of mine material

Possible available job opportunities, available immediately and later in the future:

Possible Career paths

- Senior Technician/Shotfirer
- Supervisor

Trainee entry level:

The entry level for National Vocational Certificate Level 3 in Mining sector **(Technician)** is given below:

Title	Entry requirements
National Vocational Certificate Level 3 in Mining Process Technology (Technician)	The entry requirement is Level-2 Assistant Technician in Mining Process Technology. The entry in informal sector is not prescribed.

Minimum qualification of trainer:

- A. Must be a holder of DAE/Level 5 in the relevant field with minimum 02-year relevant experience OR
- B. Minimum 16 years of education



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C. IT and computers skills will be preferred

Recommended trainer: trainee ratio

The recommended maximum trainer: trainee ratio for this program is 1 trainer for 25 trainees.

Medium of instruction i.e. language of instruction:

Instructions will be in Urdu/ English/ Local language.

Duration of the course (Total time, Theory & Practical time):

The distribution of contact hours is given below:

Total - 600 hours Theory - 120hours (20%) Practical-480 hours (80%) Proposed Course Duration-6 Months

Sequence of modules:

Module-1 Maintain Safety at Site	Module-4 Perform Blasting Operation	Module-6 Perform Basic Computer Operations
Module-2 Perform Basic communication skills		Module-7 Develop 2D drawings
Module-3 Perform Core Drilling for Mining	Module-5 Perform Conveyor Operations	Module-8 Manage Inventory of mine material



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Summary Template-Overview of the Curriculum:

Following is the structure of the course:

Sr. No	Code	Competency Standards	Occupation	NVQF Level	Category	Estimated Contact Hours			Cr Hr
						Th.	Pr	Total	
Level 3 in Mining Process Technology (Technician) Level 3									
1	724MP13-A	Maintain Safety at Site	Technician	3	Generic	16	64	80	8
2	724CO09-B	Perform Basic communication skills		3	Generic	8	32	40	4
3	724MP13-C	Perform Core Drilling for Mining		3	Technical	20	80	100	10
4	724MP13-D	Perform Operate Blasting		3	Technical	20	80	100	10
5	724MP13-E	Perform Conveyor Operations		3	Technical	16	64	80	8
6	724MP13-F	Perform Basic Computer Operations		3	Generic	12	48	60	6
7	724MP13-G	Develop 2D drawings		3	Functional	16	64	80	8
8	724MP13-H	Manage Inventory of mine material		3	Functional	12	48	60	6
		Total				120	480	600	60
		Percentage				20	80		



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Summary – overview of the curriculum

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 1: Maintain Safety at Site Aim: After successful completion of this module, the trainee is competent in maintaining safety at site and is familiar with fire-fighting and first aid.	LU1: Follow Safety Protocols for Explosives Material at Site LU2: Demonstrate Fire Fighting Exercise LU3: Perform Basic Electrical Work Safely at Workplace LU4: Carry Out First Aid Treatment (in Case of Emergency)	16	64	80
Module 2: Perform basic communication skills. Aim: After successful completion of this module, the trainee is competent in working in a team environment. Moreover, he can attend meetings, take notes and convey his input whenever needed.	LU1: Convey Workplace Information Effectively LU2: Participate in Workplace Meetings and Discussions LU3: Identify own role and responsibility within team LU4: Support the Team members	8	32	40



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Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 3: Perform Core Drilling for Mining Aim: After successful completion of this module, the trainee is competent in performing core drilling for mining	LU1: Prepare site for drilling LU2: Handle drilling equipment according to pattern LU3: Measure the mud parameters LU4: Perform manual drilling LU5: Perform rotary drilling LU6: Perform reclamation	20	80	100
Module 4: Perform Blasting Operation Aim: After successful completion of this module, the trainee is competent in performing blasting operation	LU1: Identify the types of explosives as per their properties for blasting. LU2: Maintain safety kits for blasting process LU3: Prepare layout for blasting as per plan LU4: Arrange pre-blast operations as per plan LU5: Set-up blast site LU6: Conduct post blast operations	20	80	100



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Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 5: Perform Conveyor Operations Aim: After successful completion of this module, the trainee is competent in performing conveyor operations	LU1: Prepare for conveyor operations LU2: Operate conveyor LU3: Carry out maintenance of Conveyor LU4: Conduct housekeeping activities	16	64	80
Module 6: Perform Basic Computer Operations Aim: After successful completion of this module, the trainee is competent in performing computer operations	LU1: Perform basic Configuration of Computer System LU2: Create a document using MS word LU3: Prepare Spreadsheet using MS Excel LU4: Prepare a presentation using MS Power Point	12	48	60

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
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Module 7: Develop 2D drawings Aim: After successful completion of this module, the trainee is competent in developing 2D drawings	LU1: Develop 2D Objects LU2: Prepare Final Set of 2D Drawings	16	64	80
Module 8: Manage Inventory of Mine Material Aim: After successful completion of this module, the trainee is competent in managing inventory of mine material	LU1: Inspect mineral material LU2: Measure the raw material available in the stackyard LU3: Maintain safe storage of mineral material LU4: Maintain the Log Register	12	48	60



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Module 1: Maintain Safety at site

Objective:

This competency standard covers the skills and knowledge required to maintain safe work conditions at site, and emergency response operations. Your underpinning knowledge will be sufficient to provide you with the basis for your work.

Duration: 80Hours

Theory: 16 Hours

Practice: 64 Hours

Credit Hours: 8

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU 1: Follow Safety Protocols for Explosives Material at Site	The trainee will be able to: - Identify Explosives used at the Site - Wear appropriate PPE for explosive handling. - Handle explosives gently.	- Knowledge of explosive types and classifications - Awareness of legal and regulatory requirements - Proper procedures for handling explosive materials - Safe methods for storage and transportation - Emergency protocols for explosive-related incidents - Use of personal protective equipment (PPE)	Total 20 hrs Theory: 4 hrs Practical: 16 hrs	Consumables: - Caps - Fuse - Charges - Labels - Paint Non-consumables: - Magazine box - Blasting machine - Tester - Helmet - First-aid kit	- Class Room - Simulated environment



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LU 2: Demonstrate Fire Fighting Exercise	The trainee will be able to: - Follow emergency response procedures. - Identify Classes of Fire - Select types of Fire Extinguishers - Operate fire extinguishers and hoses safely	- Describe the fire triangle - State principles of fire fighting - Describe the source of fire - Explain classes of fire - Demonstrate firefighting techniques - Recognize different types of fire extinguisher <u>Activity:</u> - Conduct a mock inspection of explosive storage to identify safety hazards and ensure compliance with safety protocols.	Total 20 hrs Theory:4 hrs Practical: 16 hrs	Consumable - Water - Foam - Dry-powder agent - CO₂ cartridge - Sand Non Consumable - Fire hose - Extinguisher unit - Nozzle - Protective helmet - Fire blanket	- Class Room - Simulated environment
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LU 3: Perform Basic Electrical Work Safely at Workplace	The trainee will be able to: - Identify required electrical tools and equipment - Use PPE and follow electrical safety rules. - Inspect tools, cables, and circuits before use. - Perform simple electrical tasks (e.g., wiring, testing).	- Knowledge of electric hazards - Describe protective measures against the electric hazards <u>Activity:</u> Practice to check and tag extension leads and cable for any visual damage	Total 20 hrs Theory: 4 hrs Practical: 16 hrs	Consumable - Wires - Connectors - Electrical tape - Heat-shrink tubes - Solder Non Consumable - Insulated screwdrivers - Insulated pliers - Multimeter - Voltage tester - Insulated gloves	- Class Room - Simulated environment
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LU4: Carry out first aid treatment (in case of emergency)	The trainee will be able to: - Identify basic elements for first aid kit - Maintain a fully stocked first aid kit - Check expiry date of medicines - Perform mock first aid treatment for minor injuries	- Describe the ABC of first aid - Describe the first aid procedure for minor cut - Describe components of first aid kit Activity: Demonstrate mock exercise of first aid treatment for minor cut	Total 20 hrs Theory: 4 hrs Practical: 16 hrs	Consumables: - Adhesive bandages - Gauze pads - Antiseptic wipes - Disposable gloves - Adhesive tape Non-consumables: - First-aid kit box - Trauma shears (scissors) - Tweezers - Splint - CPR face shield	Class Room Simulated environment
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Module 2-Perform Basic Communication skills.

Objective of the module:

The aim of this module to get the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements. It also identifies role and responsibility as a member of a team. Your underpinning knowledge will be sufficient to provide you the basis for your work

Duration: 40 Hours

Theory: 08 Hours

Practice: 32 Hours

Credit Hours: 4

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Convey Workplace Information Effectively	The trainee will be able to: - Use appropriate language for communication. - Follow standard reporting and documentation formats. - Report hazards,	- Describe the importance of effective communication - State different Sources of information - State different mode of communication - Explain types of non-verbal communication - Explain mode of communication while operating machines - Explain the method of recording the information/instructions. Activity: - Role Play each trainee to introduce himself	Total:10hrs Theory:2 hrs Practical:8hrs	Consumable: - Paper sheets - Whiteboard markers - Sticky notes - Flipchart paper - Printer toner/cartridges Non Consumable - Whiteboard - Projector - Laptop/PC - Microphone/speaker - Notice/display board	Class Room



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	incidents, and daily tasks.	Convey the job description and company general rules and regulations to fellow workers			
LU2: Participate in workplace meetings and discussions	The trainee will be able to: - Express your own opinions - Listen other's point of view without interruption - Prepare simple questions about workplace procedures	Describe the protocol of meeting Describe the role and objective of team. Activity: Participate in mock meeting for preparation to perform job.	Total: 10hrs Theory: 2 hrs Practical: 8hrs	Consumables: Notebooks Pencils Erasers Sharpeners White board marker Non Consumable - White board - Multimedia - Internet - Computer system	Class room/Lab



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU3: Identify own role and responsibility within team	The trainee will be able to: - Understand job duties and assigned tasks. - Follow given instructions - Coordinate with team members to meet goals	- Describe the importance of creating cooperative work environment - Describe the role and objective of team. - Explain risk of failure team work on the project. - State plan work and organize required resources in coordination with team Activity: - Role Play, get instruction regarding job order from supervisor and convey it to coworkers	Total: 10hrs Theory: 2 hrs Practical: 8hrs	Consumables: - Role handouts - Self-eval forms - Feedback sheets - Pens - Sticky notes Non-consumables: - Org chart - Whiteboard - Projector - Laptop/PC - Meeting table	☐ Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU4: Support the team members.	The trainee will be able to: - Assist team members in completing tasks. - Share required tools with the team members. - Communicate clearly and respectfully with team members	- Describe the importance of creating cooperative work environment - Describe the importance of resolving the co-worker's problems <u>Activity:</u> - Role Play, Support and guide stressed coworker in his work related activity	Total:10hrs Theory:2 hrs Practical:8hrs	Consumable - Feedback forms - Printed guides - Sticky notes - Pens/highlighters - Snacks/beverages Non Consumable - White board - Multimedia - Internet Computer system	☐ Class Room/Lab



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Module 3: Perform Core Drilling for Mining

Objective of the module:

This unit covers the knowledge and skills required to perform core drilling for mining. You will be able to prepare drilling site, move equipment and material to pattern and perform manual and rotary drilling. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Duration: 100Hours

Theory: 20 Hours

Practice: 80Hours

Credit Hours: 8

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Prepare Site for drilling	The trainee will be able to: - Adjust drill within specified tolerances as per drill pattern - Place indicators on drill pattern in preparation for hole drilling - Mark out drill pattern - Protect pre-existing drill holes	Explain the drilling procedure Understanding of documents required for core drilling <u>Activity:</u> Practice to prepare site for drilling	Total: 18hrs. Theory: 4hrs. Practical: 14hrs.	Consumable: - Marking paint - Survey stakes - Warning tape - Diesel fuel - Drilling mud additive Non-Consumable - Drill rig - Theodolite/GPS - Bulldozer - Compactor - Water tanker	Class Room/site



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	according to required hole				
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU2: Handle drilling equipment according to pattern	The trainee will be able to: - Identify required tools, equipment, and materials. - Set up equipment according to instructions. - Use tools and materials as per specifications	- Explain the importance of Material handling Activity: - Practice to pre-checking of drilling rig - Practice to alignment of drilling rig - Practice to identify potential hazards - Practice to protect existing drill holes	Total: 18hrs. Theory: 4hrs. Practical: 14hrs	Consumable - Drill bits - Drilling mud - Fuel - Lubricant oil - Bit inserts Non-consumable - Drill rig - Drill steel - Hoist/winch - Torque wrench - Safety helmet	☐ Class Room/site



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU3: Measure the mud parameters	<i>You must be able to:</i> - Identify the mud type - Measure the viscosity of given sample - Measure gel strength and PH of given sample	- Knowledge of types and functions of drilling mud - Importance of mud properties in drilling operations - Equipment and tools used for mud measurement - Safety and environmental considerations during mud handling Activity: - Practice to Measure viscosity , gel strength and pH of mud sample	Total-16 hrs Theory-3hrs Practice-13hrs	Consumable - Sample bottles - pH buffer solution - Filter paper - Weighing boats - Calibration fluid Non-consumable - Mud balance - Viscometer - pH meter - API filter press - Thermometer	classroom



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU4: Perform manual drilling	The trainee will be able to: - Select the area for drilling - Mark drilling points. - Select appropriate tools for manual drilling. - Operate hand-held drilling tools safely. - Ensure correct drilling angle and depth.	- Knowledge of equipment for manual drilling - Describe procedure of manual drilling <u>Activity:</u> - Practice to select drill bit for operation - Practice to perform manual drilling	Total-16 hrs Theory-3hrs Practice- 13hrs	Consumable - Auger bits - Lubricating grease - Water (flushing) - Sample bags - Marker flags Non Consumable - Hand auger assembly - T-handle bar - Extension rods - Measuring tape - Safety helmet	Class Room/Site



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU5: Perform rotary drilling	The Trainee will be able to: - Identify size of hole for drilling - Select drill bit(diamond) for rotary drilling - Perform drilling for required area	- Knowledge of equipment for rotary drilling - Describe procedure of rotary Drilling <u>Activity:</u> Practice to perform rotary drilling	Total-16 hrs Theory- 3hrs Practice- 13hrs	Consumable - Drilling mud - Drill bits - Fuel - Lubricant oil - Mud additives Non-Consumable - Rotary rig - Mud pump - Derrick/ mast - Kelly bar or top drive - Blowout preventer	Class Room/Site



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU6: Perform reclamation	The trainee will be able to: • Clear site of debris • Backfill drill holes with suitable materials. • Clean all equipment as required • Restore drainage and natural contours	• Identify Environmental and Safety Requirements for Reclamation • Execute Site Reclamation Activities <u>Activity:</u> • Backfill the borehole using drill cuttings or approved fill material and level the surface to match the surrounding ground.	Total- 16 hrs Theory- 3hrs Practice- 13hrs	Consumables: • Topsoil • Grass/seed mix • Fertilizer • Mulch • Water Non-consumables: • Excavator • Bulldozer • Grader • Roller • Hand tools (shovel, rake)	Class Room/Site



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Module 4: Perform Blasting Operation

Objective of the module:

This unit covers the knowledge and skills required to perform blasting operations. You will be able to calculate the properties of explosives, pre-blast operations, maintain magazine /kit for blasting process and detonate site. Your underpinning knowledge will be sufficient to provide you with the basis for your work.

Duration: 100 Hours

Theory: 20Hours

Practice: 80 Hours

Credit Hours: 8

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Identify the Types of Explosives as per Their Properties for Blasting	The trainee will be able to: - Classify explosives based on sensitivity and strength. - Match explosives to specific blasting requirements. - Measure detonating pressure - Report unsafe or incorrect explosive types to supervisor.	- Describe method of calculation of absolute Weight Strength (AWS), Absolute Bulk Strength (ABS), velocity, density and detonate pressure - Knowledge of explosives properties Activity: - Practice to calculate Absolute Weight Strength (AWS) , Absolute Bulk Strength (ABS) , velocity , density and detonate pressure	Total: 18hrs Theory: 4hrs Practical: 14hrs	Consumable - Detonating cord - Emulsion explosives - ANFO (Ammonium Nitrate Fuel Oil) - Blasting caps (Electric/Non-electric) - Safety fuse Non Consumable - Explosive storage box (magazine) - Blasting machine/tester	Class Room/site



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				• Tamping rod • PPE (helmet, gloves, goggles) • Explosive handling tools (pliers, cutters)	
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required		Learning Place
LU2. Maintain safety kits for blasting process	The trainee will be able to: - Inspect magazine for safety, security, and compliance. - Store explosives and accessories as per regulations - Ensure proper labeling of items. - Check expiry dates and report damaged stock.	- Explain blasting process - Knowledge of transport blasting agents Activity: - Practice to maintain magazine/kit for blasting process	Total: 18hrs Theory: 4hrs Practical: 14hrs	Consumable - First aid supplies - Batteries - Dust masks - Safety signs and tapes - Fire extinguishing agents Non Consumable - Safety helmets - Flashlights - Gas detectors - Fire extinguisher - PPE kit box		Class Room/site
				Consumable		



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LU3. Prepare layout for blasting as per plan	The trainee will be able to: • Prepare a layout for blasting as per requirements. • Verify layout with supervisor before drilling. • Mark drill hole position as per design. • Determine burden, spacing and depth. • Place signs and barriers around the blast area.	• Interpret blasting plan and site requirements. • Mark drill holes position and safety zones on site <u>Activity:</u> • Practice to prepare layout for blasting.	Total:16hrs Theory:3hrs Practical:13hrs	• Marking paint or chalk • Wooden or plastic pegs • Flagging tape or survey ribbons • Spray paint cans (for blast hole marking) • Paper or plastic drill logs Non-consumables: • Measuring tape or laser distance meter • GPS device or total station • Compass or clinometer • Blasting plan/maps clipboard • Surveyor's staff or tripod	Class Room/site
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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU4: Arrange pre-blast operations as per plan	The trainee will be able to: - Uncover blast holes. - Inspect blast holes for proper depth, diameter, and cleanliness. - Select blasting agents, explosives, and equipment. - Carry explosives material from designated place to blast-holes.	- Describe pre-blast operation. - Knowledge of documentation required for pre-blast operation. <u>Activity:</u> - Practice marking the blast area boundary and placing warning signs and flags around the blast site	Total: 16hrs Theory: 3hrs Practical: 13hrs	Consumables: - Warning tape and flags. - Marking paint or chalk - Fuse caps and detonators - Batteries Non-consumable - Measuring tape or survey equipment - Blasting machine/tester - Drill pattern layout sheet or map - Communication devices (radios or whistles) - computers	classroom



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials required	Learning Place
LU5. Set-up blast site	The trainee will be able to: - Erect physical barricades and signage - Load explosives into the holes - Fill blast holes with stemming material - Connect initiation system - Return unused explosives and materials to store	- Describe blasting agents - Explain procedure of setting- up Blast site Activity: - Practice to prepare blast site - Practice to demonstrate blasting agents	Total: 16hrs Theory: 3hrs Practical: 13hrs	Consumable	Class Room/site
				- Warning signs and barrier tape - Detonators and fuses - Marking paint or chalk - Fuel for machinery - Blasting accessories Non-consumable: - Drilling equipment - PPE (helmet, gloves, boots, goggles) - Blasting machine - Tool kit (wrenches, pliers, screwdrivers) - Siren or horn system	

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
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LU6: Conduct post blast operations	The trainee will be able to: • Locate and dispose misfires. • Flag large rocks for further fragmentation. • Record blast outcomes indicating success and misfires • Perform general house-keeping.	• Describe post-blast activities. Activity: • Practice to conduct site inspection • Practice to manage post blast activities	Total: 16hrs Theory: 3hrs Practical: 13hrs	Consumable: • Marking tape for danger zones • Dust masks • Fuel/lubricants for cleanup machinery • Documentation sheets/logbooks • Temporary signage Non-consumable: • Inspection tools • PPE • Communication devices (radio/mobile) • Lighting • Tools for muck removal	classroom
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Module 5: Perform Conveyor Operations

Objective of the module:

The aim of this module is to get knowledge, skills and understanding to perform conveyor operations.

Duration: 80 Hours

Theory: 16 Hours

Practice: 64 Hours

Credit Hours: 08

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Prepare for conveyor operations	The trainee will be able to: • Inspect conveyor system components for wear or damage • Ensure proper alignment and tension of belts. • Clear the area of obstructions and confirm readiness for operation	• Describe mine material transportation • Knowledge of potential hazards at mining sites <u>Activity:</u> • Practice to identify production requirement • Practice to identify hazards	Total: 20hrs Theory: 04hrs Practical: 16hrs	Consumables: • Lubricants • Cleaning cloths and solvents • Fasteners • Inspection tags or labels Non-consumables: • Conveyor system • PPE • Tools • Lockout/tagout kit • Fire extinguisher	Class Room/ workshop



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU2: Operate conveyor	The trainee will be able to: • Start conveyor system following standard operating procedures. • Monitor material flow and system performance during operation. • Adjust feed rate. • Shutdown conveyor as per standard protocols. • Record operational data.	• Explain working of audio and safety indicators • Knowledge of conveyor operation • Describe types of conveyor Activity: • Practice to transfer mine material • Practice to operate conveyor	Total: 20hrs Theory: 4hrs Practical: 16hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Duster Non Consumable • White board • Multimedia • Internet • Computer system • Conveyor	Class Room/ workshop



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU3: Carry out maintenance of Conveyor	The trainee will be able to: - Identify routine maintenance tasks - Conduct inspection and find faults - Clean components and replace or repair faulty parts - Lubricate moving parts for efficient operation.	- Describe importance of routine maintenance of conveyor - Understanding of different faults in conveyor Knowledge of record maintenance Activity: - Practice to conduct inspection of conveyor belt.	Total: 20hrs Theory:4hrs Practical:16hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - White board marker - Duster Non-consumable - Multimedia - Computer - Conveyor belt and component - alarms	Class Room/ workshop



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU4: Conduct housekeeping activities	The trainee will be able to: - Remove all debris from the operation site - Maintain conveyor equipment after operation - Complete all documentation as per given format - Report hazards and complete housekeeping records	- Explain methods use for housekeeping activities - Knowledge of documentation required for housekeeping Activity: Practice to conduct housekeeping	Total: 20hrs Theory:4hrs Practical:16hrs	Consumable: - Cleaning agents - Garbage bags - Paper towel - Dust masks Non Consumable - Vacuum cleaner - PPE	Class Room/ workshop



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Module 6- Perform Basic Computer Operations

Objective of the module:

This Competency Standard identifies the competencies required to install basic computer hardware, software, applications and troubleshooting. Trainee will be able to apply acquired skills in operating a computer system and software such as MS Word, MS PowerPoint, MS Excel as well as installation and troubleshooting of operating system and software. The underpinning knowledge regarding basic computer operations will be sufficient to provide the basis for trainee's work.

Duration: 60 Hours

Theory: 12Hours

Practice: 48 Hours

Credit Hours: 06

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Perform basic configuration of computer system	The trainee will be able to: • Identify computer hardware components • Assemble and disassemble the computer system • Install operating system • Install essential drivers • Configure basic system settings	• Describe Computer hardware components • Assembly and disassembly procedures • Operating system installation • Driver installation and configuration • Basic system settings configuration	Total: 15hrs Theory: 03hrs Practical: 12hrs	Consumables: • DVDs/USBs (OS/media) • Thermal paste • Cable ties • Cleaning wipes • Labels/stickers Non-consumables: • Computer system (PC) • Screwdriver set • Monitor • Keyboard & mouse • Power supply unit (PSU)	Computer Lab



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LU2: Create a document using MS word	The trainee will be able to: - Open MS Word to select a blank page. - Format Word Document according to given requirements. - Print Word Documents according to requirements. - Save the document with desired name and location	- Describe the page set up and paragraph for formatting. - Describe the font size and style. Knowledge of short keys - Explain printing and type of printers. Activity: - Practice of short keys, document opening/closing, saving, coping and pasting. - Practice of creating and editing a word document	Total: 15hrs Theory: 03hrs Practical: 12hrs	Consumables: - Notebooks - Pencils - Erasers - Sharpeners - Marker - Duster Non Consumable - White board - Computer - Multimedia - Software CD - internet	Computer Labs



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU3: Prepare Spreadsheet using MS Excel	The trainee will be able to: - Develop a worksheet as per given data. - Format the worksheet according to given criteria. - Apply Formulas according to the requirement. - Generate Charts/Graphs according to the given data. - Print Worksheet according to requirements.	- Explain different types of formulas in MS Excel - Describe short Keys MS Excel Activity: - Develop a practice to develop a work sheet as per given data Format and apply a formula to a work sheet according to the requirement. - Practice to generate chart/graph according to given data.	Total: 15hrs Theory: 03hrs Practical: 12hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - Pen White board marker Non Consumable - White board - Multimedia - Internet - Computer - MS Office software	Computer Lab



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU4: Prepare a presentation using MS Power Point	The trainee will be able to: - Insert Slides with different Layouts according to requirements of presentation. - Insert text, tables, images, etc. according to the requirement. - Apply a set of effects to animate the slide according to requirement. - Apply Slide Transitions on Slides according to requirement. - Apply Sound Effects on Objects/text/images according to requirement. - Presentation	- Explain types of presentation format - Describe short Keys of MS power point Activity: - Practice of inserting slides different layout according to the requirement of presentation. Practice of inserting text, tables, images into the slides. - Practice of applying effects, slide transition and sound effects according to requirement.	Total: 15hrs Theory: 3hrs Practical: 12hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - Whiteboard marker Non Consumable - White board - Multimedia - Internet Computer system	☐ Computer Lab



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Module7- Develop 2D Drawings

Objective of the module:

This competency standard covers the skills and knowledge required to develop and prepares 2D objects. The underpinning knowledge regarding 2D drawings will be sufficient to provide the basis for trainee's work

Duration: 80 Hours

Theory: 16 Hours

Practice: 64 Hours

Credit Hours: 08

Learning Unit	Learning Outcomes	Learning Elements	Duration	Material s Require ^d	Learning Place
LU1.Develop 2D Objects	Trainee will be able to: - Launch 2D design software (i.e. AutoCAD). - Set up drawing parameters (units, layers, and grid). - Create basic shapes using drawing - Save AutoCAD drawing files in different file formats	- Explain import export of drawing sketch in different formats in CAD Software - Explain 2D setup - Functions of Creating and Editing tools - Dimensions and Symbols - Different file extensions for saving files (JPEG, PDF, etc.) <u>Activity:</u> - Draw and practice of different drawings related to mining	Total: 40hrs Theory: 08hrs Practical: 32hrs	Consumables - Notebook - Pencils - Erasers - Sharpen - White marker - Duster - USB Non Consumable - White board - Internet - Computer	Computer Lab



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Material Require	Learning Place
LU2.Prepare final sets of 2D drawings	Trainee will be able to: - Use appropriate command and tools to develop 2D Drawing - Develop 2D Drawing with given project specifications and measurements - Create title block layout as required - Plot drawing on scale according to required size and orientation	- Knowledge of scale and unit - Procedure to prepare 2D drawing according to given scale Activity: - Draw and practice a layout of different civil structures	Total: 40hrs Theory: 8hrs Practical: 32hrs	Consumable - Notebook - Pencils - Erasers - Sharpen - White B marker - Duster - USB Non Consumable - White board - Multimedia - Internet - Computer system - Printer	Computer Lab



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Module 8: Manage Inventory of Mine Material

Objective:

This competency standard identifies the competencies required to manage inventory of mine material. You will be able to maintain log register, measure the raw material available in dump yard, perform safe storage of raw material, and inspect raw material. Your underpinning knowledge will be sufficient to provide you with the basis for your work.

Duration: 60 Hours

Theory: 12 Hours

Practice: 48 Hours

Credit Hours: 06

Learning Unit	Learning Outcomes	Learning Elements	Duration	Material required	Learning Place
LU1. Inspect mineral material	Trainee will be able to: - Collect mineral samples following standard sampling procedures. - Examine physical properties such as color, texture, and grain size. - Identify impurities visually or with basic tools. - Record inspection results and report any abnormalities.	- Knowledge about the safety of aggregates against the weather and dust - Explain the importance of gradation of aggregates - Define flaky and elongated aggregates - Describe site material characteristics Activity: - Practice of maintaining log register on daily bases.	Total:15hrs Theory:3hrs Practical:12hrs	Consumables: - Sample bags or envelopes - Labels and markers - Moisture absorbent packets - Field log sheets or tags - Cleaning wipes Non-consumables: - Magnifier - Hammer	Class Room / Site



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		Practice of generating report in case of any deficiency		- PPE - Weighting scale	
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LU2. Measure the raw material available in the stack yard	Trainee will be able to: - Calculate amount of material available on site - Cross check with the log register - Adjust the demands in accordance with the available raw materials - Manage the production plan accordingly	- Explain types of Aggregates - Describe classification of aggregates according to nature of size and shape - Explain characteristics of graded fine and coarse aggregates - Describe principles of safe and efficient storage <u>Activity:</u> - Practice of calculating the amount of material available on site. - Practice of adjusting demands in accordance with available raw material.	Total:15hrs Theory:3hrs Practical:12hrs	Consumables: - Making chalks - Tags or labels - dust masks Non-consumables: - measuring tape - GPS device - PPE	Class Room/ Site
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LU3. Maintain safe storage of mineral material	Trainee will be able to: • Dump materials as per graded sizes • Check materials quality & quantity visually as per standard procedures • Ensure ground preparation to prevent contamination of mined material. • Maintain the log book of materials In/Out	• Describe moisture of aggregates • Knowledge about safety of aggregates against the weather and dust • Describe the importance of gradation of aggregates <u>Activity:</u> • Practice of dumping material as per graded sizes. • Practice of checking material quality and quantity as per standards. • Practice of maintaining log book of material	Total:15hrs Theory:3hrs Practical:12hrs	Consumable • Warning signs • Cover sheets • Storage record Non-consumables: • Storage containers • PPE • Fire extinguisher • Material handling tools	☐ Class Room / Site
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LU4. Maintain the Log Register	Trainee will be able to: • Manage the Log Register on daily basis • Enter the data corresponding to every type of raw material • Audit the Log register with on the site materials • Report to the in charge in case any issues are found • Prepare the production / dispatch record sheet	• Record operational data accurately in the log register following standard formats and procedures. • Review and update entries to ensure completeness, clarity, and compliance with reporting requirements. <u>Activity:</u> • Review previous shift entries and record current shift data (e.g., equipment used, work completed, and personnel involved) in the log register with correct date and time	Total: 15hrs Theory: 3hrs Practical: 12hrs	Consumable • Log register • Makers • labels Non Consumable • Computer • File cabinet • Calculator • PPE	☐ Class Room / Site
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List of Tool, Machinery, Equipment and Consumables:

SR#	Items/Tools /Equipment &Consumables
1.	PPEs: Safety Helmet Safety Shoes Earmuffs Gloves Goggles Face Shields. Surgical Face Masks Safety blanket Safety harness Safety Belts Safety Apron
2.	Safety net



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3.	Shovels with handle
4.	Computer Systems
5.	Scanner
6.	Printer
7.	Chain Hoist
8.	Sieve set
9.	Digital Balance
10.	Fire Buckets.
11.	Fire Extinguishers
12.	First aid Kit
13.	Hooks / Anchors
14.	Manufacturers Operation and Maintenance Manual & Video
15.	Measuring Tape
16.	Multimeter
17.	Slings
18.	Jackhammer
19.	Cameras
20.	Stationary Items
21.	Log Books
22.	Application Software
23.	Internet router
24.	Spatula
25.	Various hand / power tools



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26.	Stretcher
27.	Engine and stop engine lights (orange and red)
28.	Display instrumentation and gauges (indicators, gauges, laser levels), computer systems
29.	Fluid levels (windscreen washer tank, hydraulic oil, coolant, grease, water, engine oil, fuel)
30.	Visual and audio warning devices and lights
31.	Viscometer
32.	Air filter restriction indicator
33.	Mechanical tool kit
34.	Drilling equipment and machine
35.	Blasting machine and tools
36	Ancillary equipment (generators, pumps, lights, compressors, cleaning equipment, power tools, hand tools)
37.	pH meter
38.	Visual and audio warning devices and lights
39.	Calculator
40.	Conveyor belt and component
41.	Inventory register
42.	Screw driver set
43.	Plier



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44.	Slip joint plier
45.	Socket set
46.	Hand hacksaw
47.	Chisel
48.	Tong
49.	Claw hammer
50.	Ball peen Hammer
51.	Straight peen Hammer
52.	Grip pliers
53.	Nose pliers
54.	L-key sets
55.	Pipe wrench

56.	Set of Spanners (Open end, Ring)
57.	Set of Adjustable Wrench
58.	Dial Bore Gauge
59.	Snap Gauge set
60.	Micrometer
61.	Feeler gauges
62.	Screw pitch gauges
63.	Thread gauges
64.	Vernier Caliper



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65.	Tri Square
66.	Steel Rules
68.	Conveyors



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