



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



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



(Curriculum)



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



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

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Introduction

Definition/Description of training program (Junior Technician)

Mining sector is one of the booming industries of Pakistan. There is an increasing demand of the Junior 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 non-commercial projects etc. If an individual is planning to take up Junior 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:

The purpose of the training is to provide skilled manpower to improve the existing construction industry. More than 96 % of the Pakistani manpower is working in GCC countries where Saudi Arabia (50.90%) and UAE (33.10%) are the largest destination countries followed by Oman (7.26%), Kuwait (1.90%), Bahrain (1.58%), and Qatar (1.41%). The overseas Pakistanis are playing a pivotal role to support the economy in the form of remittances. According to new labor laws, a large number of skilled labors is demanded by Saudi Government especially for the construction sector. For this purpose, new qualifications have



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been developed by NAVTTTC on CBT&A mode in order to train the unskilled human resource with employable skills and cater the demand of Saudi Government. 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 2 in Mining Process Technology (Junior Technician) are as follows:

- Improve the professional competence of mining process
- Capacitate the local community and trainers in modern CBT training, methodologies and processes as envisaged under NVQF
- Provide flexible pathways and progressions in the mining sector
- Enable the trainees to perform their duties in efficient manner
- Establish a standardized and sustainable system of training for Mining Process technology across globe

Competencies to be gained after completion of course:

At the end of the course, the trainee has attained the following core competencies:

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1. Follow Safety Rules at Site
2. Perform Basic Communication Skills
3. Demonstrate Basic Numeracy Skills
4. Draw Basic Technical Drawings



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5. Perform Basic Bench Work Operations
6. Interpret Topographic Map
7. Interpret Geological Map
8. Interpret Mineral Map
9. Perform Basic Electricity Applications
10. Perform Safe Handling of Explosive Material

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

Possible Career paths

- Junior Technician
- Technician
- Operations Manager
- Mine Manager
- Process Manager
- Production manager
- Maintenance Manager
- Site Manager
- Superintendent



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Trainee entry level:

The entry level for National Vocational Certificate Level 2 in Construction Sector **(Junior Technician)** is given below:

Title	Entry requirements
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Minimum qualification of trainer:

A. Must be a holder of DAE/Level 5 Diploma in Civil Technology with at least 2 years relevant experience

OR

B. B.Sc Engineering Technology (Civil) / B.E Civil /B.Sc Civil Engineering

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.



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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 Follow Safety Rules at Site	Module-5 Perform Basic Bench Work Operations	Module-8 Interpret Mineral Map
Module-2 Perform Basic Communication Skills		Module-9 Perform Basic Electricity Applications
Module-3 Demonstrate Basic Numeracy Skills	Module-6 Interpret Topographic Map	Module-10 Perform Safe Handling of Explosive Material
Module-4 Draw Basic Technical Drawings	Module-7 Interpret Geological Maps	



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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 2									
1	724CO08	Follow Safety Rules at Site	Junior Technician	2	Generic	9	21	30	3
2	001100851	Perform Basic Communication Skills		2	Generic	9	21	30	3
3	724CO08	Demonstrate Basic Numeracy skills		2	Functional	18	42	60	6
4	724CO08	Perform Basic Technical Drawing		2	Functional	23	57	80	8
5	724MP012	Perform Basic Bench Work Operations		2	Technical	10	90	100	10
6	724MP012	Interpret Topographic Map		2	Technical	7	33	40	4



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7	724MP012	Interpret Geological Maps		2	Technical	6	24	30	3
8	724MP012	Interpret Mineral Map		2	Technical	6	24	30	3
9	724CO012	Perform Basic Electricity Applications		2	Technical	16	84	100	10
10	724MP012	Perform Safe Handling of Explosive Material		2	Technical	16	84	100	10
		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: Follow Safety Rules at Site Aim: After successful completion of this module, the trainee is competent in Following of Safety Rules at Site	LU1: Maintain occupational safety and health at workplace LU2: USE Personal Protective and Safety Equipment (PPE) LU3: Perform Communication Signals LU4: Manual Handling of Loads	9	21	30
Module 2: Perform Basic Communication Skills Aim: After successful completion of this module, the trainee is competent in performing basic communication skills	LU1: Communicate in aTeam LU2: Follow Supervisor's instructions as per Organizational SOPs	9	21	30



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Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 3: Demonstrate Basic Numeracy Skills Aim: After successful completion of this module, the trainee is competent in demonstrating basic numeracy skills	LU1: Apply Basic Numeracy Skills LU2: Perform Basic Measurement LU3: Calculate Area and Volume of Object	18	42	60
Module 4: Perform Basic Technical Drawing Aim: After successful completion of this module, the trainee is competent in performing basic technical drawing	LU1: Explore Lettering, Lines and symbols LU2: Draw Different Geometrical Shapes LU3: Explore Orthographic views of simple shapes LU4: Dimension the drawing	23	57	80



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Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 5: Perform Basic Bench Work operations Aim: After successful completion of this module, the trainee is competent in performing basic computer operations	LU1: Carry out Drilling LU2: Carry out Counter Sinking and Counter Boring LU3: Carry out Reaming LU4 : Perform General Housekeeping & Maintenance	10	90	100
Module 6: Interpret Topographic Map Aim: After successful completion of this module, the trainee is competent in interpreting Topographic Map	LU1: Utilize Grid Reference and GPS LU2: Illustrate Administrative Index LU3: Locate The Specfic/Required Area In Sheet LU4: Setout Legends of Topographic Sheet	7	33	40



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Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 7: Interpret Geological Maps Aim: After successful completion of this module, the trainee is competent in interpreting Geological Maps	LU1: Illustrate Rock units LU2: Recognize geological structure LU3: Illustrate legends LU4: Identify Geological map symbols	6	24	30
Module 8: Interpret Mineral Map Aim: After successful completion of this module, the trainee is competent in interpreting Mineral Map	LU1 Identify mineral zones LU2: Identify different minerals LU3: Identify gem stone	6	24	30



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Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 9: Perform Basic Electricity Applications Aim: After successful completion of this module, the trainee is competent in performing basic electricity applications	LU1: Interpret Electrical layout LU2: Perform Basic Electric Circuits LU3: Perform Basic Electrical Measurements LU4: Perform three phase connection	16	84	100
Module 10: Perform Safe Handling of Explosive Material Aim: After successful completion of this module, the trainee is competent in performing safe handling of explosive material	LU1: Perform safe transportation of blasting material LU2: Perform safe storage of Blasting Material	16	84	100



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Module 1: Follow Safety Rules at site

Objective: The aim of this module to get knowledge, skills and understanding to follow safety rules at site.

Duration: 30Hours

Theory: 9 Hours

Practice: 21 Hours

Credit Hours: 3

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Maintain occupational safety and health at workplace	<p>The trainee will be able to:</p> <ol style="list-style-type: none"> 1. Identify the safety signs and symbols 2. Erect barricades, hoardings, signage in the hazardous areas 3. Maintain housekeeping 4. Report unsafe condition to immediate supervisor (shift person) 	<ul style="list-style-type: none"> • Knowledge of different types of hazards • Explain unsafe working conditions • Understanding of health and safety signs and symbols • Explain housekeeping • Understanding of different methods of dealing with hazard <p>Activity:</p>	<p>Total 6hrs</p> <p>Theory: 2 hrs</p> <p>Practical: 4 hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • White Board Marker <p>Non Consumable</p> <ul style="list-style-type: none"> • White board • Multimedia 	<ul style="list-style-type: none"> • Class Room • Simulated environment



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
		Practice to identify the physical hazards in mock situation and apply control measures, safety sign and barricade.			
LU2: Use Personal Protective and Safety Equipment (PPE)	The trainee will be able to: <ol style="list-style-type: none"> 1. Identify risk associated with job to be done 2. Select PPE according to job 3. Wear PPE according to job 4. Store PPE at Designated place after use 	<ul style="list-style-type: none"> • Describe the types of Personal protective equipment (PPEs) • Describe the procedure to identify risk associated with job to be done • Importance of personal protective equipment • Describe the Maintenance and cleaning of PPEs • Describe the procedure to 	Total: 9 hrs Theory: 3hrs Practical: 6hrs	Consumable <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • White Board Marker Non Consumable <ul style="list-style-type: none"> • White board • Multimedia • PPEs (Safety 	<ul style="list-style-type: none"> • Class Room • Simulated environment



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
		wear full body harness <u>Activity:</u> <ul style="list-style-type: none"> Demonstrate to select PPEs for specific job. Practice to wear full body harness and anchorage 		glasses, Ear muffs/ear plugs, Protective Gloves, Cap, Safety shoes etc.)	
LU3: Perfrom communication signals	The trainee will be able to: <ol style="list-style-type: none"> Identify different types of communication hand signals. Use appropriate hand signals as per situation 	<ul style="list-style-type: none"> Understanding of different types of communication signals Explain different types of hand signals Explain the importance of hand signals <u>Activity:</u> Demonstrate the hand signals for different activities	Total 6hrs Theory: 2 hrs Practical: 4 hrs	<div>Consumable</div> <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White Board Marker <div>Non Consumable</div> <ul style="list-style-type: none"> White board Multimedia 	<ul style="list-style-type: none"> Class Room Simulated environment



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
				<ul style="list-style-type: none"> Safety manuals 	
LU4: Manual handling of loads	The trainee will be able to: <ol style="list-style-type: none"> Check the load's weight to be handles Check the availability of broad stable base Lift and place the load with proper posture Lift the load as per given standards 	<ul style="list-style-type: none"> Explain the importance of safely lifting loads Describe types of loads Explain basic ergonomics principles State the load lifting procedures <p>Activity: Practice of shifting manually the load from ground to a designated location.</p>	Total: 9 hrs Theory: 2hrs Practical: 7hrs	<div>Consumable</div> <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White Board Marker <div>Non Consumable</div> <ul style="list-style-type: none"> White board Multimedia Internet Computer system 	<ul style="list-style-type: none"> 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 knowledge, skills and understanding to perform basic communication.

Duration: 30 Hours

Theory: 9 Hours

Practice: 21 Hours

Credit Hours: 3

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Demonstrate the basic communication skills	The trainee will be able to: <ol style="list-style-type: none"> 1. Demonstrate the listening skills 2. Demonstrate the reading skills 3. Demonstrate the writing skills 4. Demonstrate the speaking skills 	<ul style="list-style-type: none"> • Knowledge of communication skills (7Cs of effective communication) • Describe verbal and non-verbal communication • Explain reporting techniques <p>Activity:</p> <ul style="list-style-type: none"> • Practice to listen to the audio and write down • Practice to note down the instructions given by the supervisor 	Total: 15 hrs Theory: 5hrs Practical: 10hrs	<div>Consumable</div> <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • White board marker <div>Non Consumable</div> <ul style="list-style-type: none"> • White board 	<ul style="list-style-type: none"> • Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU2. Follow Supervisor's instructions	The trainee will be able to: <ol style="list-style-type: none"> 1. Carry out the instructions of the supervisor 2. Report to the supervisor as per organizational SOP's given standards 	<ul style="list-style-type: none"> • Explain the note taking procedure • Understanding of the standard procedure to prepare the report <p><u>Activity:</u></p> <ul style="list-style-type: none"> • Prepare different office reports 	<p>Total: 15 hrs</p> <p>Theory: 4hrs</p> <p>Practical: 11hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • White board marker <p>Non Consumable</p> <ul style="list-style-type: none"> • White board 	<ul style="list-style-type: none"> • Class Room



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Module 3: Demonstrate Basic Numeracy Skills

Objective of the module: The aim of this module is to get knowledge, skills and understanding to demonstrate basic numeracy skills

Duration: 60 Hours

Theory: 18 Hours

Practice: 42Hours

Credit Hours: 6

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1:Apply Basic Numeracy Skills	The trainee will be able to: <ol style="list-style-type: none"> 1. Perform basic mathematical calculations as per given task 2. Perform DMAS rule as per given calculation. 3. Calculate percentages of given task 	<ul style="list-style-type: none"> • Understanding of basic principles of addition, subtraction, multiplication division of whole number and fraction • Explain how to calculate percentage • Knowledge of DMAS rule <p>Activity:</p> <ul style="list-style-type: none"> • Practice of addition, subtraction, multiplication division of whole number and fraction • Practice to calculate percentage 	<p>Total: 10hrs.</p> <p>Theory: 2 hrs.</p> <p>Practical: 8hrs.</p>	<p>Consumable</p> <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • Pen • White board marker <p>Non Consumable</p> <ul style="list-style-type: none"> • White board 	<ul style="list-style-type: none"> • Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
		between referred number			
LU2: Perform Basic Measurement	The trainee will be able to: <ol style="list-style-type: none"> 1. Collect geometric tools for required measurements 2. Measure length of given object by using standard units 3. Perform inter conversion of Measuring units as per requirement 	<ul style="list-style-type: none"> • Understanding of basic measuring units. • Knowledge of measuring tools • Understanding of Imperial and metric system of measurements. • Explain the inter-conversion between measuring units. 	Total: 20hrs Theory: 4hrs Practical: 16hrs	<div>Consumable</div> <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • White board marker <div>Non</div> <div>Consumable</div>	<ul style="list-style-type: none"> • Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
		Activity: <ul style="list-style-type: none"> Take the measurement of different geometrical figures with scale. Practice to measure the boundaries of specific land and calculate its area and perimeter. Take the measurements of different solids Practice of inter-conversion of units. 		<ul style="list-style-type: none"> White board Multimedia Internet Computer system Printer Measuring tape Scale 	
LU3: Calculate Area and Volume of object	The trainee will be able to: <ol style="list-style-type: none"> Calculate Area and Volume of given object Calculate surface area of given object 	<ul style="list-style-type: none"> Knowledge of geometrical figures and solids. Understanding the surface area and volume of solid figures. Explain the method of 	Total: 30hrs Theory: 4hrs. Practical: 26hrs	Consumable <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White board marker 	Class Room/workshop



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
	<p>3. Calculate volume of material in the given object</p> <p>4. Calculate quantities of materials (stone, aggregate, stacks/piles and sand) by incorporating time saving practices</p>	<p>calculating quantity of material in piles/stack.</p> <p>Activity:</p> <ul style="list-style-type: none"> Practice to calculate the surface area and volume of given geometrical figures and solids. Practice to calculate quantity of material in piles/stack. 		<p>Non Consumable</p> <ul style="list-style-type: none"> White board Multimedia Internet Computer system Printer Measuring tape Scale 3D model of geometrical solids 	



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Module 4: Perform Basic Technical Drawing

Objective of the module: The aim of this module is to get knowledge, skills and understanding to draw basic technical drawing

Duration: 80 Hours

Theory: 23Hours

Practice: 57 Hours

Credit Hours: 8

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Explore Lettering, Lines and symbols	The trainee will be able to: <ol style="list-style-type: none"> 1. Draw different types of lettering 2. Draw different types of lines 3. Draw different drawing symbols 	<ul style="list-style-type: none"> • Knowledge of different types of lines • Knowledge of different lettering style. • Understanding of symbols used in technical drawings. • Knowledge of different scales. • Understanding of different drawing pencils (Clutch pencil Mechanical pencils, etc.) • Understanding of different grades of lead pencils(H,HB,B) • Knowledge of different drawing sheets (scholar sheet, chart paper, Canson Sheet, etc.) 	Total: 20hrs Theory: 5hrs Practical: 15hrs	Consumable <ul style="list-style-type: none"> • Notebooks • Erasers • Sharpeners • White board marker • Drawing sheets • Drawing pen • Masking tape • Different 	<ul style="list-style-type: none"> • Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
		Activity: <ul style="list-style-type: none"> Practice to draw of title block Practice to draw of different lines Practice to draw of different types of lettering Practice of drawing symbols		drawing pencils <ul style="list-style-type: none"> Scale <div>Non Consumable</div> <ul style="list-style-type: none"> White board Multimedia Internet Computer system Drawing board Drawing instruments 	
LU2.Explore Orthographic views of simple shapes	The trainee will be able to: <ol style="list-style-type: none"> Draw first angle projection 	<ul style="list-style-type: none"> Knowledge of orthographic projection Explain the rules of 1st and 3rd angle projection 	Total: 45hrs Theory: 13hrs	<div>Consumable</div> <ul style="list-style-type: none"> Notebooks Erasers 	<ul style="list-style-type: none"> Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
	2. Draw third angle projection 3. Draw missing views 4. Draw different section views	<ul style="list-style-type: none"> • Explain pictorial drawings • Understanding of sectional views <p>Activity:</p> <ul style="list-style-type: none"> • Practice to draw first angle projection of simple object blocks. • Practice to draw third angle projection of simple object blocks. • Practice to draw the missing view of different given orthographic projection. • Practice to draw the section view of different blocks. 	Practical: 32hrs	<ul style="list-style-type: none"> • Sharpeners • White board marker • Drawing sheets • Drawing pen • Masking tape • Different drawing pencils • Scale <div>Non</div>	



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
				Consumable <ul style="list-style-type: none"> White board Multimedia Internet Computer system Drawing board Drawing instruments 	
LU3. Dimension the drawing	1. Draw different types of dimensions. 2. Draw geometrical tolerance.	<ul style="list-style-type: none"> Describe the different dimensioning principles Explanation of geometrical tolerance <p>Activity:</p> <ul style="list-style-type: none"> Practice to dimension the given orthographic projections with 	Total: 15 hrs Theory: 5 hrs Practical: 10hrs	Consumable <ul style="list-style-type: none"> Notebooks Erasers Sharpeners White board marker Drawing sheets 	Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
		different dimensioning style.		<ul style="list-style-type: none"> • Drawing pen • Masking tape • Different drawing pencils • Scale • Non-Consumable • White board • Multimedia • Internet • Computer system • Drawing board • Drawing instruments 	



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Module 5- Perform Basic Bench Work Operations

Objective of the module: The aim of this module is to get knowledge, skills and understanding to perform basic bench work Operations.

Duration: 100 Hours

Theory: 10Hours

Practice: 90 Hours

Credit Hours: 10

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Carry out Drilling	<p>The trainee will be able to:</p> <ol style="list-style-type: none"> 1. Select drilling bit according to the material 2. Select marking tool and mark the job as per drawing 3. Select clamping device and clamp the work piece 4. Set the machine RPM according to the drill size and work piece material 5. Mark centre with the help of centre punch 6. Perform drilling as per standard procedures 7. Perform post drilling operations 8. Verify the final job with the given drawing 	<ul style="list-style-type: none"> • Knowledge of PPEs • Knowledge of drilling machine function • Understanding of drilling procedure • Define quality sampling <p>Activity:</p> <ul style="list-style-type: none"> • Practice to making holes using drilling machine 	<p>Total: 24hrs</p> <p>Theory:3 hrs</p> <p>Practical:21hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Duster • Chalk <p>Non Consumable</p> <ul style="list-style-type: none"> • White board • Multimedia • Internet • Computer system • Drilling machine • Drill chuck 	<ul style="list-style-type: none"> • Class Room/ workshop



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
				with Key Machine Vice <ul style="list-style-type: none"> • Marking Tools • Measuring Tools • Drill Sleeve and Socket • PPEs • Counter drill • Cutting oil • Tri square • Measuring Tool 	
LU2: Carry out Counter Sinking and Counter Boring	The trainee will be able to: <ol style="list-style-type: none"> 1. Select counter sinking tool according to the drawing 2. Select marking tool and mark the job as per drawing 3. Select clamping device and clamp the work 	<ul style="list-style-type: none"> • Explain usage of measurement and marking tools • Knowledge of simple arithmetic calculation • Describe simple measurements using metric and imperial 	Total: 27hrs Theory: 3hrs Practical: 24hrs	Consumable <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners 	<ul style="list-style-type: none"> • Class Room/ workshop



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
	<p>piece</p> <ol style="list-style-type: none"> 4. Perform drilling operation as per drawing 5. Set the machine RPM according to the counter sink size and work piece material 6. Perform counter sinking as per standard procedures 7. Verify the final job with the given drawing 	<p>systems</p> <ul style="list-style-type: none"> • Knowledge of conversion of linear unit for measurement unit <p>Activity:</p> <ul style="list-style-type: none"> • Practice to interpret sketches of different types of bent up bars, stirrups and chairs, sort out its cut length and mark on straight rebars 		<ul style="list-style-type: none"> • White board marker • Duster • Chalk Non Consumable • White board • Multimedia • Internet • Computer system • Drilling machine • Drill chuck with Key Machine Vice • Marking Tools • Measuring Tools • Drill Sleeve and Socket 	



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
				<ul style="list-style-type: none"> PPEs Counter drill Cutting oil Tri square Measuring Tool 	
LU3: Carry out Reaming	The trainee will be able to: <ol style="list-style-type: none"> Select appropriate reamer according to the job specification Select appropriate marking tool and mark the job as per drawing Select appropriate clamping device and clamp the work piece Perform drilling to produce hole according to the size of reamer Perform reaming as per job specification Verify the final job with given drawing 	<ul style="list-style-type: none"> Describe cutting tools of rebars Explain fixing and cutting blade and other accessories in cutting and bending machine Explain capacity and required details of cutting machines, bending machine. Explain types of hand tool available for cutting and bending Describe BBS in order to carry out cutting and bending of reinforcement. Knowledge of storing of cut rebars and scrap material 	Total: 26hrs Theory: 2hrs Practical: 24hrs	Consumable <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White board marker Duster Chalk Non Consumable <ul style="list-style-type: none"> White board Multimedia 	<ul style="list-style-type: none"> Class Room/ workshop



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
		<ul style="list-style-type: none"> Understanding of tolerance limits for bending and cutting of rebars <p>Activity:</p> <ul style="list-style-type: none"> Practice to cut rebars of different dia as per marked cut length. 		<ul style="list-style-type: none"> Internet Computer system Drilling machine Drill chuck with Key Machine Vice Marking Tools Measuring Tools Drill Sleeve and Socket PPEs Counter drill Cutting oil Tri square Measuring Tool 	



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU4: Perform General Housekeeping & Maintenance	The trainee will be able to: <ol style="list-style-type: none"> Clean and maintain all workplace tools & machines as per housekeeping checklists or given instructions Prepare checklist for daily cleanliness of the workplace Place all tools & material in proper place to ensure safe work Fill checklists to conduct maintenance and housekeeping of machines & tools 	<ul style="list-style-type: none"> Explain guidelines and checklists to conduct maintenance and housekeeping of tools & equipment. Explain the Importance of daily cleanliness of workplace. Explain the Importance of storing tools and material in specific place. Knowledge of faulty/damaged/ worn out parts of tools & equipment. Explain the Importance of Record keeping. <p>Activity:</p> <ul style="list-style-type: none"> Practice of sorting different types of tool, trace defects and perform maintenance. 	<p>Total: 23hrs</p> <p>Theory:2hrs</p> <p>Practical:21hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners Whiteboard marker Chalk <p>Non Consumable</p> <ul style="list-style-type: none"> White board Multimedia Internet Computer system Tool box Layout tools Cutting tools Measuring tools Precision tools 	<ul style="list-style-type: none"> Class Room/ workshop



Objective of the module: The aim of this module is to get knowledge, skills and understanding to interpret topographic map.

Credit Hours: 4

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Grid Reference and GPS usage	Trainee will be able to: 1. Identify the longitude and latitude of given location 2. Use GPS (global positioning system) to locate given site 3. Use Brunton compass to find direction 4. Identify the number of topographic sheet 5. Scale of topographic sheet as per requirements 6. Identify the values	<u>Knowledge based question</u> • Define longitude and latitude of location • Define GPS • Define Brunton compass • Define topography • How to measure distance between two specific points of topographic region <u>Activity:</u> • Reading map as per GPS reference location	Theory- 2Hrs Practical- 9Hrs Total- 11Hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Duster Non Consumable • White board • Multimedia • Internet • Computer system • Topographic sheet • GPS • Brunton compass	Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
	<p>of longitude and latitude of given site</p> <p>7. Measure distance between two specific points on topographic sheet</p>	<ul style="list-style-type: none"> Find direction by using Brunton compass Calculate longitude and latitude of given site Measure distance between two specific points on topographic sheet <p>Activity</p> <ul style="list-style-type: none"> Reading map as per GPS reference location Find direction by using Brunton compass Calculate longitude and latitude of given site Measure distance between two specific points on topographic sheet 		<ul style="list-style-type: none"> Plain table 	
<p>LU2.</p> <p>Illustrate Administrative</p>	<p>Trainee will be able to:</p> <p>1. Identify geographical</p>	<ul style="list-style-type: none"> Define geographical location of topographic sheet 	<p>Theory-2Hrs</p> <p>Practical-9Hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> Notebooks Pencils Erasers 	Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
Index	location of topographic sheet 2. Identify number of adjacent topographic sheet	Activity: <ul style="list-style-type: none"> Identify manmade and natural features on topographic sheets Identify geographical boundaries of different administrative zones on topographic sheets 	Total-11Hrs	<ul style="list-style-type: none"> Sharpeners White board marker Duster Non Consumable White board Multimedia Internet Computer system Topographic sheet GPS Brunton compass Plain table 	
LU3. Locate Specific/Required Area In Sheet	1. Calculate area of ore body on topographic sheet 2. Calculate mining area of required location	<ul style="list-style-type: none"> Describe method of calculate area of ore body Describe method of calculate mining area 	Theory-1Hrs Practical-6Hrs Total-7Hrs	Consumable <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White board marker Duster Non 	Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
		<u>Activity</u> <ul style="list-style-type: none"> Practice to calculate area of ore body on topographic sheet Practice to calculate mining area of required location Practice to plan accessibility of far off mines using topographic sheets 		Consumable <ul style="list-style-type: none"> White board Multimedia Internet Computer system Topographic sheet GPS Brunton compass Plain table 	
LU4. Legends of Topographic Sheet	<ol style="list-style-type: none"> Identify the natural and man-made features on topographic sheet Identify water bodies, vegetation cover, agricultural land, mountainous and plain area Identify man- 	<ul style="list-style-type: none"> Knowledge of natural and manmade features on topographic sheet Understanding of water bodies <u>Activity:</u> <ul style="list-style-type: none"> Practice to identify landforms by reading contours 	Theory-2Hrs Practical-9Hrs Total-11Hrs	Consumable <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White board marker Duster Non Consumable <ul style="list-style-type: none"> White board 	Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
	<p>made structures (roads, railway lines, towns etc.)</p> <p>4. Identify the landforms by reading contours</p>	<ul style="list-style-type: none"> Practice to identify geomorphologic features on topographic sheets 		<ul style="list-style-type: none"> Multimedia Internet Computer system Topographic sheet GPS Brunton compass Plain table 	



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Module7- Interpret Geological Maps

Objective of the module: The aim of this module to get knowledge, skills and understanding to interpret geological maps.

Duration: 30 Hours

Theory: 06 Hours

Practice: 24Hours

Credit Hours: 3

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Illustrate Rock units	Trainee will be able to: <ol style="list-style-type: none"> Find out geological formation of given rock Recognize age of given rock Understand dip and strike Understand type of lithology (limestone, 	<ul style="list-style-type: none"> Knowledge of geological formation of rock Define the terms dip and strike Describe lithology Activity: <ul style="list-style-type: none"> Practice to find out geological formation of given rock Practice to recognize age of given rock Practice to understand dip and strike 	Theory-2Hrs Practical-6Hrs Total-8Hrs	Consumable <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White board marker Duster Rebars Chalk Non Consumable <ul style="list-style-type: none"> White board Multimedia Internet Computer 	Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
	sandstone, shale etc.) 5. Understand boundaries of different rock units.	<ul style="list-style-type: none"> Practice to understand type of lithology Practice to understand boundaries of different rock units 		system <ul style="list-style-type: none"> Geological map Plain table 	
LU2. Recognize geological structure	Trainee will be able to: 1. Illustrate Fold 2. Identify faults (reverse, normal, strike-slip) 3. Identify joints 4. Identify foliation and lineation 5. Understand anticline syncline 6. Learn about unconformity	<ul style="list-style-type: none"> Knowledge of fold and fault symbol Knowledge of foliation and lineation Describe anticline and syncline Understanding of unconformity Activity: <ul style="list-style-type: none"> Practice to identify fold, faults and joints Practice to identify foliation and lineation Practice to identify anticline and 	Theory-2Hrs Practical-6Hrs Total-8Hrs	Consumable <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White board marker Duster Rebars Chalk Non Consumable <ul style="list-style-type: none"> White board Multimedia Internet Computer system 	Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
		syncline		<ul style="list-style-type: none"> Geological map Plain table 	
LU3. Illustrate legends	Trainee will be able to: <ol style="list-style-type: none"> Identify Formation legend Identify structure legend Understand lithology legend 	<ul style="list-style-type: none"> Understanding of formation legend Describe identification of structure legend Knowledge of lithology legend <p>Activity</p> <ul style="list-style-type: none"> Practice to identify Formation and structure legend Practice to identify lithology legend 	Theory-1Hrs Practical-6Hrs Total-07Hrs	<div>Consumable</div> <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White board marker Duster Rebars Chalk <div>Non Consumable</div> <ul style="list-style-type: none"> White board Multimedia Internet Computer system Geological map 	Class Room



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Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
				<ul style="list-style-type: none"> Plain table 	
LU4. Identify Geological map symbols	Trainee will be able to: <ol style="list-style-type: none"> Learn dip and strike symbol Identify unconformity symbol Identify fold and fault symbols 	<ul style="list-style-type: none"> Explain dip and strike symbol Knowledge of unconformity symbol Understanding of fold and fault symbol <p>Activity</p> <ul style="list-style-type: none"> Practice to calculate dip and strike symbol Practice to identify unconformity, fold and fault symbols 	<p>Theory-1Hrs</p> <p>Practical-06Hrs</p> <p>Total-07Hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White board marker Duster Rebars Chalk <p>Non Consumable</p> <ul style="list-style-type: none"> White board Multimedia Internet Computer system Geological map Plain table 	Class Room

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Identify mineral zones	Trainee will be able to: 1. Understand Sedimentary area 2. Recognize Igneous area 3. Recognize Metamorphic area	<ul style="list-style-type: none"> Knowledge of sedimentary and igneous rock Understanding of metamorphic area <p><u>Activity:</u></p> <ul style="list-style-type: none"> Practice to understand sedimentary, igneous and metamorphic area Practice to identify hardness of different rocks using Moho's hardness scale 	Theory-02Hrs Practical-08Hrs Total-10Hrs	<div>Consumable</div> <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners White board marker Duster Rebars Chalk <div>Non Consumable</div> <ul style="list-style-type: none"> White board Multimedia Internet Computer system Mineral maps 	Class Room /Lab/ Field Visit



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				<ul style="list-style-type: none"> Moho's hardness tester XRF handheld gun 	
LU2. Identify different minerals	Trainee will be able to: <ol style="list-style-type: none"> Identify sulphide and oxide minerals according to rock form Recognize carbonates Recognize silicates Phosphates Highlight Native elements (gold, silver etc.) 	<ul style="list-style-type: none"> Understanding of sulphide and oxide minerals Knowledge of carbonates, silicates and phosphate from rocks <p>Activity:</p> <ul style="list-style-type: none"> Practice to identify sulphide, oxide, carbonates Silicates, phosphates and native elements 	<p>Theory-02Hrs</p> <p>Practical-08Hrs</p> <p>Total-10Hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners Whiteboard marker Duster Chalk Rebars <p>Non Consumable</p> <ul style="list-style-type: none"> White board Multimedia PPEs Computer Mineral maps Moho's hardness tester XRF handheld gun Plain table 	<p>Class Room</p> <p>Training Workshop</p> <p>Lab/ Field Visit</p>



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<p>LU3.</p> <p>Identify gem stone</p>	<p>Trainee will be able to:</p> <ol style="list-style-type: none"> 1. Recognize emerald, topaz, ruby, sapphire etc. 2. Estimate the hardness of gem stone 	<ul style="list-style-type: none"> • Understanding of emerald, topaz, ruby and sapphire • Describe the method of estimation the hardness of gem stone <p>Activity:</p> <ul style="list-style-type: none"> • Practice to identify emerald, topaz, ruby, sapphire etc. • Practice to estimate the hardness of gem stone 	<p>Theory-02Hrs</p> <p>Practical-08Hrs</p> <p>Total-10Hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Duster • Rebars • Chalk <p>Non Consumable</p> <ul style="list-style-type: none"> • White board • Multimedia • Internet • Computer system • Mineral maps • Moh's hardness tester • XRF handheld gun • Plain table 	
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Module 9- Perform Basic Electricity Applications

Objective: The aim of this module is to get knowledge, skills and understanding to perform basic electricity applications.

Duration: 100 Hours

Theory: 16 Hours

Practice: 84 Hours

Credit Hours: 10

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Interpret Electrical layout	Trainee will be able to: <ol style="list-style-type: none"> 1. Interpret layout of the job for installations 2. Interpret electrical drawing for electrical wirings 3. Connect components of equipment according to drawing 	<ul style="list-style-type: none"> • Illustrate electrical symbols to be used in drawings • State different type of electrical wire gauges and insulation. • Elaborate AC and DC Current • Describe Ohm's Law and Kirchhoff Law. • Explain electrical circuit diagram 	Theory-04Hrs Practical-18Hrs Total-22Hrs	<div style="background-color: #d3d3d3; padding: 2px;">Consumable</div> <ul style="list-style-type: none"> • Notebooks • Pencils • Insulation tape • Electrical wire of different color code and gauges • White board marker <div style="background-color: #d3d3d3; padding: 2px;">Non</div> <div style="background-color: #d3d3d3; padding: 2px;">Consumable</div>	Class Room/workshop



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		<ul style="list-style-type: none"> Explain layout of electrical components in circuit diagram <p>Activity:</p> <ul style="list-style-type: none"> Practice to interpret electrical circuit diagram and layout of the job. Practice of connecting electrical components as per circuit diagram 		<ul style="list-style-type: none"> White board PPES Multimedia Internet Computer system Electrical Circuit Board Multi meter Wire cutter Wire clipper Continuity tester 	
LU2. Perform Basic Electric Circuits	Trainee will be able to: <ol style="list-style-type: none"> Prepare series circuit on work bench Prepare parallel circuit on work bench Prepare Head and Tail Light 	<ul style="list-style-type: none"> Describe electrical connection scheme of the job Elaborate handling techniques for placement 	Theory-04-Hrs Practical-21-Hrs Total- 25 Hrs	Consumable <ul style="list-style-type: none"> Notebooks Pencils Insulation tape Electrical wire of different color code and 	Class Room/workshop



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	<p>Circuit on work bench</p> <p>4. Prepare indicator circuit on work bench</p>	<p>for electrical equipment</p> <ul style="list-style-type: none"> Describe parallel and series circuit. <p><u>Activity:</u></p> <ul style="list-style-type: none"> Practice of performing electrical measurement and prepare series and parallel electrical circuit according to diagram Practice to prepare head and tail light circuit on work bench Practice to prepare indicator circuit on work bench 		<p>gauge</p> <ul style="list-style-type: none"> White board marker Cable clips Spring push connectors <p>Non Consumable</p> <ul style="list-style-type: none"> White board PPES Multimedia Internet Computer system Electrical Circuit Board Multi meter Wire cutter Wire clipper 	
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<p>LU3. Perform Basic Electrical Measurements</p>	<p>Trainee will be able to:</p> <ol style="list-style-type: none"> 1. Measure voltage 2. Measure current 3. Measure resistance 4. Test continuity 	<ul style="list-style-type: none"> • Describe Voltage, Current, Resistance and Continuity of current • Differentiate between earthing and testing procedures • Elaborate working principle of earth tester • Elaborate L.C.R meter <p><u>Activity:</u></p> <ul style="list-style-type: none"> • Practice to measure Voltage, Current, Resistance and Continuity in circuit 	<p>Theory-04-Hrs</p> <p>Practical-21-Hrs</p> <p>Total- 25 Hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> • Notebooks • Pencils • Insulation tape • Electrical wire of different color code and gauge • White board marker <p>Non Consumable</p> <ul style="list-style-type: none"> • White board • PPES • Multimedia • Internet • Computer system • Electrical Circuit Board 	<p>Class</p> <p>Room/workshop</p>
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				<ul style="list-style-type: none"> • Multi meter • Wire cutter • Wire clipper • Continuity tester 	
LU4. Perform three phase connection	Trainee will be able to: <ol style="list-style-type: none"> 1. Select cable gauge 2. Select cables colors 3. Connect cables 4. Insulate Joints 	<ul style="list-style-type: none"> • Elaborate methods of installing the electrical appliances. • Describe different methods of cable testing • Describe different types of coding procedures (e.g. color coding / tagging / numbering) <p>Activity:</p> <ul style="list-style-type: none"> • Practice of power supply connection to the three phase motor as per circuit diagram 	Theory-04-Hrs Practical-24-Hrs Total- 28 Hrs	<div>Consumable</div> <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • Whiteboard marker • Duster • Chalk • Spacers <div>Non Consumable</div> <ul style="list-style-type: none"> • White board • Multimedia • PPEs • Computer 	Class Room/ Workshop



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Module 10- Perform Safe Handling of Explosive Material

Objective: The aim of this module to get knowledge, skills and understanding to perform safe handling of explosive materil.

Duration: 100Hours

Theory: 16Hours

Practice: 84 Hours

Credit Hours: 10

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Perform safe transportation of blasting material	Trainee will be able to: <ol style="list-style-type: none"> Keep detonator/primer and blasting material separately while transferring as per SOP Keep electrostatic charge to be dissipated Maintain appropriate distance between blasting and flammable material 	<ul style="list-style-type: none"> Knowledge of detonator and blasting materials Understanding of electrostatic charge <p>Activity:</p> <ul style="list-style-type: none"> Practice to follow SOPs for keeping detonator/primer and blasting material separate while transferring Prepare Head and Tail Light Circuit on workbench using 	Theory-8Hrs Practical-42Hrs Total-50Hrs	<div style="background-color: #d3d3d3; padding: 2px;">Consumable</div> <ul style="list-style-type: none"> Notebooks Pencils Erasers Sharpeners Whiteboard marker Duster <div style="background-color: #d3d3d3; padding: 2px;">Non Consumable</div> <ul style="list-style-type: none"> White board Multimedia Computer PPEs Transportation 	Class Room Training Workshop Lab/ Field Visit



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		<p>appropriate tools.</p> <ul style="list-style-type: none"> • Prepare indicator circuit on workbench using appropriate tools 		<p>and storage machines</p> <ul style="list-style-type: none"> • Blasting material 	
<p>LU2. Perform safe storage of Blasting Material</p>	<p>Trainee will be able to:</p> <ol style="list-style-type: none"> 1. Store all blasting material away from populated area under surveillance 2. Storage room should keep away from electric wires and metallic materials. 	<ul style="list-style-type: none"> • Define blasting materials <p>Activity:</p> <ul style="list-style-type: none"> • Practice to safe storage of blasting material • Practice to perform safe blasting activity 	<p>Theory-8Hrs</p> <p>Practical-42Hrs</p> <p>Total-50Hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> • Notebooks • Pencils • Erasers • Sharpeners • Whiteboard marker • Duster <p>Non Consumable</p> <ul style="list-style-type: none"> • White board • Multimedia • PPEs • Transportation and storage machines • Blasting material 	<p>Class Room/ Workshop</p>



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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
2.	Computer Systems
3.	Scanner
4.	Printer
5.	Drilling machine with accessories



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6.	Drilling tools (twist drill, center drill, counter boring tool , reamer, taps etc)
7.	Surface Grinding Machine with accessories and consumables
8.	Steel Rules
9.	Tri Square
10.	Vernier Caliper
11.	Thread gauges
12.	Screw pitch gauges
13.	Fillet gauges
14.	Feeler gauges
15.	Set of Adjustable Wrench
16.	Set of Spanners (Open end, Ring)
17.	Pipe wrench
18.	L-key sets



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19.	Nose pliers
20.	Grip pliers
21.	Straight peen Hammer
22.	Long nose Tong
23.	Short nose tong
24.	Flat Chisel
25.	Scraper of different shapes
26.	scriber
27.	Hand hacksaw
28.	Diamond hand file set
29.	Riffle hand file set
30.	Needle hand file set
31.	Round hand file



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32.	Half round hand file
33.	Triangular hand file
34.	Square hand file
35.	Flat hand file
36.	Drawing board
37.	Mineral maps
38.	Moh's hardness tester
39.	XRF handheld gun
40.	Plain table
41.	Stationary items
42.	Transportation and storage machines
43.	Multimeter
44.	Wires



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45.	Measuring tools
46.	Tester
47.	Topographic sheet
48.	Brunton compass
49.	GPS
50.	Graph and drawing sheet
51.	Geometry Box
52.	T-Square
53.	Set Square
54.	Templates
55.	Compass
56.	Divider
57.	Drawing pencils



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58.	Protractor
59.	Measuring tapes
60.	Calculator
61.	Materials of various Types
62.	First Aid Box
63.	Oxygen Cylinder
64.	Safety sign boards



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12.	Shahbaz Muhammad	Assistant geophysicist GSP, Lahore
13.	Muhammad Usman Alvi	Scientific Officer, PCSIR LABS, Lahore
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Members of the Curriculum Validation Committee

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8.	Mohammad Shahbaz	Assistant Director, Mining Development Cell, Lahore
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