



Model Curriculum

Mechanic / Fitter

SECTOR: MINING

SUB-SECTOR: ENGINEERING SERVICES

OCCUPATION: MECHANICAL SERVICE

REF ID: MIN/Q0304

NSQF LEVEL: 3



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

SKILL COUNCIL FOR MINING SECTOR

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: 'Mechanic / Fitter' QP No. 'MIN/Q_0304_NSOE Level 3'

Date of Issuance: December 24th, 2015

Valid up to: March 31st, 2017

Authorised Signatory
(Skill Council for Mining Sector)

* Valid up to the next review date of the Qualification Pack



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Mechanic / Fitter

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Mechanic / Fitter”, in the “Mining” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Mechanic / Fitter		
Qualification Pack Name & Reference ID.	MIN/Q0304		
Version No.	1.0	Version Update Date	10 – 12 – 2015
Pre-requisites to Training	Xth pass or ITI / Diploma in mechanical		
Training Outcomes	<p>After completing this programme, participants will be able to: Maintenance and repair of mechanical systems in HEMM and other vehicles /machine assemblies.</p> <p>Fitter will be responsible for repair, maintenance and overhaul of crushers, heavy earth moving machinery, medium and light vehicles, pumps and compressors and other mechanical equipment and assemblies used in a mine. A fitter most often works with / assists technicians who are more qualified and experienced.</p> <p>Identify and use basic tools, equipment & materials: Understanding of carrying out tool box, machinery equipment for its operation.</p>		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Mechanic / Fitter” Qualification Pack issued by “SSC: Skill Council for Mining Sector”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Introduction</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 10:00</p> <p>Corresponding NOS Code Bridge Module</p>	<p>Understanding of following</p> <p>The Mechanic / Fitter works like maintenance of HEMM Vehicles, its tyre, rotation, torque of HEMM, type of HEMM machine, Workshop rules, equipment handling, proper keeping of tool box etc.</p> <p>Repair the machinery found faulty or replace with appropriate part and able to fit the part at original place with replacement.</p>	<p>bucket loader, front loader, front-end loader, pay-loader, scoop, shovel, skip loader, or wheel loader</p>
2.	<p>Perform Preventive Maintenance.</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 45:00</p> <p>Corresponding NOS Code MIN/N 0309</p>	<p>This unit is about installation and preventive maintenance activities for HEMM, light vehicles and other machine assemblies.</p> <p>The Mechanic / fitter must be able to conduct:</p> <ul style="list-style-type: none"> • Installing machines, mechanical components and equipment. • Conducting preventive maintenance of machine components in HEMM and other vehicles. • Various types of tools (spanners, jacks etc.) and their use. • Tracking and logging preventive maintenance activities. • Different types of heavy earth moving machines (H.E.M.M) used in open cast mines and their specific functions • Various types of lubricants and their importance. Storage and handling of lubricants. • Various types of bearings used in machines and their assembly techniques • Hot & Cold tyre pressure as per size of tyre, • Repair and overhauling Electronic and mechanical engines, manual and power shift transmissions • Use ropes, slings, towing and lifting devices while assembling equipment. 	<p>Tool Box, Assemble, old engine, spanner, jack comparison part, Sample Helmet, gloves, harness, earplugs, goggles, node mask.</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> Follow drawings and blue-prints given in the installation manual. Follow the manufacturer's instructions which apply to the care and safe handling of the machine / automobile Track hours-in-operation and adhere to preventive maintenance schedules of various vehicles assigned to him. Maintain inventory and order fuel and other supplies. 	
3.	<p>Perform Troubleshooting and Repair</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 70:00</p> <p>Corresponding NOS Code MIN/N0310</p>	<p>This unit is about performing troubleshooting and repair activities of mechanical systems in HEMM, light vehicles and other machines.</p> <ul style="list-style-type: none"> Perform Diagnostics, Troubleshooting and repair of mechanical components in HEMM Perform systematic recording and reporting of repair activities conducted. Compare measured readings to optimal readings to pin-point faults Service, diagnose and repair faults in mechanical systems such as gears, steering systems, hydraulic pumps, transmission, crawlers, conveyor belts etc. Ensure the machine is on firm and level ground before attempting to carry out any maintenance activity. Ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only) Ensure that no maintenance task on the engine is performed when running or still hot Repair or replace faulty parts Use various kinds of hand held and power-tools to lift, dismantle or assemble machine components. Fine tune and adjust valves, belt tensions for optimal operation. Test repaired equipment to ensure everything is working correctly and safely (this may include road testing the vehicle). 	<p>Tool Box, Assemble, old engine, comparison part, gloves, Industrial workers helmet, Signage, poster on road traffic, rules & signs in mining, Safety poster on accidents, fire & environmental disasters, Fire extinguishers, Cradle, Paddling, Shovel, Safety jackets, Gloves, Safety shoes, Torch</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
4.	<p>Health & Safety</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 15:00</p> <p>Corresponding NOS Code MIN / N0204</p>	<p>This unit is about health and safety measures critical in open-cast mines</p> <ul style="list-style-type: none"> Health and safety measures critical for personnel working in open-cast mines Comply with occupational health and safety regulations adopted by the employer. Follow mining operations procedures with respect to materials handling and accidents. Adhere to the safety guidelines specified by Directorate General of Mine Safety (DGMS). 	<p>Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box</p>
	<p>Total Duration</p> <p>Theory Duration (hh:mm) 60:00</p> <p>Practical Duration (hh:mm) 150:00</p>	<p>Unique Equipment Required:</p> <p>Tool Box, Assemble, old engine, spanner, jack comparison part, Sample Helmet, gloves, harness, earplugs, goggles, node mask etc.</p>	

Grand Total Course Duration: 210 Hours, 0 Minutes

*(This syllabus/ curriculum has been approved by **SSC: Skill Council for Mining Sector**)*

Trainer Prerequisites for Job role: “Mechanic / Fitter” mapped to Qualification Pack: “MIN/Q0304”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “MIN/Q0304”.
2	Personal Attributes	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	Preferably Class X Passed / ITI and statutory certificate.
4a	Domain Certification	Statutory Certificate from Directorate General of Mines Safety (DGMS) for Job Role: “Mechanic / Fitter” mapped to QP: “MIN/Q0304”. Minimum accepted score for domain certification will be 85%.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/Q1402”. Minimum accepted score for platform certification will be 90%.
5	Experience	2-3 years of experience in mechanical services.

Annexure: Assessment Criteria

Assessment Criteria for Mechanic / Fitter	
Job Role	Mechanic / Fitter
Qualification Pack	MIN/Q0304
Sector Skill Council	Mining

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment of the theory/knowledge will be based on written test/viva-voce or both while skill test shall be hands on practical. Behaviour and attitude will be assessed while performing the task.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5	To pass the Qualification Pack, every trainee should score a minimum of 70%. Weightage distribution for assessment will be 30 % for theory and 70% for practical.
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessment outcome	Assessment Criteria	Marks Allocation			
		Total Mark (100)	Out Of	Theory	Skills Practical
1. MIN/N 0309 (Perform preventive maintenance)	PC1. Use ropes, slings, towing and lifting devices while assembling equipment.	35	3	1	2
	PC2. Safely operate various types of hand and power-tools.		3	1	2
	PC3. Follow drawings and blue-prints given in the installation manual.		3	0	3
	PC4. Follow the manufacturer's instructions which apply to the care and safe handling of the machine / automobile.		3	1	2
	PC5. Test assembled machine for proper performance before handing over for operations		3	0	3
	PC6. Adhere to maintenance schedule recommended by the equipment manufacturer.		2	1	1
	PC7. Lubricate sufficiently and neatly all pivot points in a machine.		3	0	3
	PC8. Open and re-assemble various types of bearings in machines.		3	1	2
	PC9. Adjust valves and hydraulic systems for smooth operation.		3	1	2
	PC10. Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk.		2	0	2
	PC11. Track hours-in-operation and adhere to preventive maintenance schedules of various vehicles assigned to him.		2	1	1
	PC12. Maintain a checking/maintenance logbook to record all activities performed.		2	1	1
	PC13. Inform supervisor of problems that are beyond scope of his role .		2	1	1
	PC14. Maintain inventory and order fuel and other supplies.		1	0	1
	Total	35	9	26	

Assessment outcome	Assessment Criteria	Marks Allocation			
		Total Mark (100)	Out Of	Theory	Skills Practical
2. MIN/N 0310 (Perform troubleshooting and repair)	PC1. Use various measuring and testing instruments and record readings	35	2	1	1
	PC2. Compare measured readings to optimal readings to pin-point faults		2	1	1
	PC3. Service, diagnose and repair faults in mechanical systems such as gears, steering systems, hydraulic pumps, transmission, crawlers, conveyor belts etc.		3	1	2
	PC4. Ensure the machine is on firm and level ground before attempting to carry out any maintenance activity.		3	1	2
	PC5. Ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only).		3	1	2
	PC6. Ensure that no maintenance task on the engine is performed when running or still hot		3	0	3
	PC7. Repair or replace faulty parts		3	1	2
	PC8. Use various kinds of hand held and power-tools to lift, dismantle or assemble machine components.		3	0	3
	PC9. Fine tune and adjust valves, belt tensions for optimal operation.		3	0	3
	PC10. Test repaired equipment to ensure everything is working correctly and safely (this may include road testing the vehicle).		3	2	1
	PC11. Complete timely and legibly daily/weekly maintenance/defect sheets as provided by the company.		2	1	1
	PC12. Assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel.		3	1	2
	PC13. Inventory and order spares and consumables as required.		2	1	1
			Total	35	11

Assessment outcome	Assessment Criteria	Marks Allocation			
		Total Mark (100)	Out Of	Theory	Skills Practical
3. MIN/ N0204 (Health and Safety)	PC1. Comply with occupational health and safety regulations adopted by the employer.	30	4	1	3
	PC2. Follow mining operations procedures with respect to materials handling and accidents.		4	1	3
	PC3. Ensure use of protective gear while working with mechanical systems.		4	2	2
	PC4. Comply with safety regulations and procedures in case of fire hazard.		4	2	2
	PC5. Operate various grades of fire extinguishers.		4	1	3
	PC6. Follow correct safety steps in case of major accident, major failure		4	1	3
	PC7. Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk, including members of the public.		3	0	3
	PC8. Wears safety gear such as hard hat, respiratory protection, eye protection		3	1	2
	NOS TOTAL	Total	30	9	21
	QP TOTAL		100	29	71



Skill Council for Mining Sector

FIMI House, B-311, Okhla Industrial Area, Phase-I, New Delhi-110 020