



Model Curriculum

QP Name: Supervisor Maintenance (Infrastructure Equipment)

QP Code: IES/Q1201

QP Version: 3.0

NSQF Level: 5

Model Curriculum Version: 1.0

Infrastructure Equipment Skill Council (IESC), Jubilee Building (Second Floor), No.45, Museum Road,
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Training Parameters

Sector	Infrastructure Equipment
Sub-Sector	Equipment Service and Spares
Occupation	Equipment Maintenance
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/ 3122.5200
Minimum Educational Qualification and Experience	Graduation in the relevant field OR Graduation in any field with 1 years of experience OR 3-year Diploma (after 12th Class) in the relevant Field OR Previous relevant Qualification of NSQF Level 4 with 2 years of relevant experience
Pre-Requisite License or Training	NIL
Minimum Job Entry Age	20 Years
Last Reviewed On	26/05/2022
Next Review Date	31/05/2025
NSQC Approval Date	26/05/2022
QP Version	2.0
Model Curriculum Creation Date	30/04/2022
Model Curriculum Valid Up to Date	31/05/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	540 Hours
Maximum Duration of the Course	540 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills

- Monitor the maintenance of the engine and power train systems.
- Identify and use diagnostic tools and equipment to locate faults.
- Demonstrate the techniques for removal of defective components, rectification, re-assembly and testing.
- Understand the procedure for reporting and escalating unresolved problems.
- Plan and schedule the maintenance of the engine and power train system.
- Classify Health, safety and environment policies.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	4	0	0	0	4
NOS Code IES/N1201 NOS Name – Supervise preventive maintenance and minor repair work NOS Version - 3.0 NSQF Level - 4	60	90	60	0	210
NOS Code – IES/N 1202 NOS Name – Supervise corrective maintenance of equipment NOS Version - 3.0 NSQF Level - 4	60	90	60	0	210
NOS Code - IES/N 7602 NOS Name - Comply with Workshop Health and Safety Guidelines NOS Version - 3.0 NSQF Level - 4	30	30	0	0	60
DGT/VSQ/N0102: Employability Skills (60 Hours)	60	0	0	0	60

Total Duration	210	210	120	0	540
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Module Details

Module 1: Orientation

Terminal Outcomes:

- Describe the operations of the infrastructure industry in India.
- Outline the skill training schemes in the Skill Sector Councils.
- Discuss about the different types of job roles available in IESC.
- Explain the roles and responsibilities of the Supervisor Maintenance (Infrastructure Equipment).

Duration: <4:00>	Duration: <0:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the importance of skill training and bridging the skill gap to improve work efficiency. • Explain the roles and responsibilities of Supervisor Maintenance (Infrastructure Equipment). • Understand and describe the scope of employment opportunities in the industry for Supervisor Maintenance (Infrastructure Equipment) job role • Describe different technical trainings conducted in SSC to multi skill an individual. 	NIL
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster	
Tools, Equipment and Other Requirements	

Module 2: Preventive Maintenance

Mapped to NOS Code – IES/N 1201 v3.0

Terminal Outcomes:

- Understand the importance of preventive maintenance to reduce the repair cost of the equipment
- Prepare a proper schedule to conduct preventive maintenance on all the equipment at the intervals specified by the manufacturer.
- Explain the process of planning and organising repair and maintenance in the most efficient and cost effective way.
- Read and understand the general instructions/ manuals/ guidelines related to equipment.

Duration: <60:00>	Duration: <150:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain in depth the function and purpose of the equipment components such as engine, pump. • Understand the importance of preventive maintenance to reduce the repair cost of the equipment. • Elaborate the manufacturer’s recommendation on preventive maintenance measures. 	<ul style="list-style-type: none"> • Monitor equipment periodical maintenance as per the schedule. • Conduct preventive maintenance on the equipment. • Discuss with the customer regarding the condition of the equipment. • Plan for the repair of the components based on the results derived in preventive maintenance. • Convince the customer of the importance of preventive maintenance before failure of the component.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Cut-outs and models of major parts like filters and pumps. Manufacturer’s Engine Service and Repair Manual	
Tools, Equipment and Other Requirements	
Diesel Engine 4 or 6 cylinder with Turbocharger & all related components, assemblies, accessories, standard tools and lab equipment for dis-assembly and assembly	

Module 3: Corrective Maintenance

Mapped to NOS Code – IES/N 1202 v3.0

Terminal Outcomes:

- Test and confirm the failure of the component and identify the defect in the system.
- Explain the methods to troubleshoot various problems with diagnostic tools.
- Discuss with customers as and when necessary to understand problems and issues
Demonstrate the repair/replacement of defective components using approved tools and procedures.
- Prepare a repair estimate and arrange parts to complete the component repair.
- Prepare a complete list of parts to be procured and initiate procurement action.
- Prepare and maintain a file for the repair history file of every equipment.

Duration: <60:00>	Duration: <150:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Test and confirm the failure of the component and identify the defect in the system. • Explain the methods to troubleshoot various problems with diagnostic tools. • Understand the manufacturer’s guidelines for regular maintenance and repair of the equipment. • Know how to perform a failure analysis to find out the root cause of the failure. 	<ul style="list-style-type: none"> • Discuss with customers as and when necessary to understand problems and issues. • Demonstrate the repair/replacement of defective components using approved tools and procedures. • Check the correctness of the parts list and repair estimate prepared by mechanic. • Assign a mechanic to repair / replacement defective components, monitor and supervise. • Prepare SOPs for the mechanic to check the performance of equipment components.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard/flip chart, markers and duster Cut-outs & models of major parts like filters and pumps Manufacturer’s Engine Service/Repair Manual	
Tools, Equipment and Other Requirements	
Diesel Engine 4/6 cylinder with Turbocharger & all related components /assemblies/ accessories Standard tools and lab equipment for dis-assembly and assembly	

Module 4: Workshop health and safety

Mapped to NOS Code: IES/N 7602 v3.0

- Describe the guidelines for health, safety and security requirements.
- Discuss common hazards and risks at workshop and preventive measures.
- Employ safe practices when working with tools and machines.
- Explain the emergency procedure to stop/ shut down machinery.
- Demonstrate appropriate basic first aid treatment for common injuries.
- Demonstrate handling and using firefighting equipment.
- Elaborate the guidelines for storage and disposal of hazardous materials and waste.
- Describe various safety signs/symbols and warnings used in workshops and their meaning.

Duration: <30:00>	Duration: <30:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the Health, safety, environmental (HSE) policies and guidelines of the company & their importance. • Explain the reporting channel and documentation procedure for all HSE related matters. • List the contact details of personnel responsible for HSE related matters & in case of emergencies. • Explain the emergency procedure to stop/ shut down machinery. • Discuss common hazards and risks at workshop and preventive measures. • Classify waste based on non-recyclable, hazardous and recyclable material. • Describe various safety signs/symbols and warnings used in workshops and their meaning. 	<ul style="list-style-type: none"> • Employ safe practices when working with tools and machines. • Demonstrate the correct use of Personal Protective Equipment (PPE). • Demonstrate handling and using firefighting equipment. • Demonstrate appropriate basic first aid treatment for common injuries. • Prepare a hazard log register and report incidents and accidents. • Carry out a mock drill for firefighting, emergency exit escape routes, emergency equipment usage and assembling for evacuation. • Demonstrate safe storage and disposal of hazardous materials and waste.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard/flip chart, marker and duster	
Tools, Equipment and Other Requirements	
Fire Extinguishers, Personal Protective Equipment and other safety gears	

Module 6: Employability Skills

Mapped to NOS: DST/VSQ/N0102

Terminal Outcomes:

At the end of this module, the learner should have acquired the listed knowledge and skills.

- Discuss the importance of Employability Skills in meeting the job requirements
- Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen
- Show how to practice different environmentally sustainable practices
- Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mind-set in different situations
- Demonstrate how to communicate in a well -mannered way with others
- Demonstrate working with others in a team
- Show how to conduct oneself appropriately with all genders and PwD
- Discuss the significance of reporting sexual harassment issues in time
- Discuss the significance of using financial products and services safely and securely
- Show how to operate digital devices and use the associated applications and features, safely and securely
- Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely
- Explain the significance of identifying customer needs and addressing them
- Discuss the significance of maintaining hygiene and dressing appropriately
- Create a biodata
- Use various sources to search and apply for jobs
- Discuss how to search and register for apprenticeship opportunities

Duration: 00:00	Duration: 60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Discuss the importance of Employability Skills in meeting the job requirements • Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen. • Show how to practice different environmentally sustainable practices • Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations • Demonstrate how to communicate in a well -mannered way with others • Demonstrate working with others in a team • Show how to conduct oneself appropriately with all genders and PwD • Show how to operate digital devices and use the associated applications and features, safely and securely • Create a biodata • Use various sources to search and apply for jobs • Describe opportunities as an entrepreneur
Classroom Aids:	
Computer, projector, printer, student table, whiteboard/flip chart, marker, duster	
Tools, Equipment and Other Requirements	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate or Diploma in Mechanical Engineering		2	1	1		
Trainer Certification						
Domain Certification			Platform Certification			
Certified for Job Role: Supervisor Maintenance (Infrastructure Equipment) mapped to QP: IES/Q1201 – Version 2.0 Minimum accepted score 70%			Certified for Job Role: Supervisor Maintenance (Infrastructure Equipment) Minimum accepted score 70%			

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
Diploma in Mechanical Engineering		3		1		

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: Supervisor Maintenance (Infrastructure Equipment) mapped to QP: IES/Q1201 – Version 2.0 Minimum accepted score 70%	Certified for Job Role: Supervisor Maintenance (Infrastructure Equipment) Minimum accepted score 70%

Assessment Strategy

Criteria for assessment for Qualification Pack has been laid down based on the NOS's.

Each Performance Criteria (PC) has been assigned marks proportional to its importance within NOS and weightages have also been given among the NOSs accordingly.

The assessment of the theory/knowledge will be based on written test/viva or both while skill test shall be hands on practical.

Behavior and attitude will be assessed while performing the assigned task.

The assessment shall be done as per the guidelines formulated by IESC.

The assessment agencies in consultation with IESC will create unique question papers for theory/knowledge and practical skills at each IESC accredited testing centers (as per assessment criteria below)

To pass the Qualification Pack, every trainee should score a minimum of 70%.

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.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training .
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module . A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
QRC	Qualification Review Committee
SSC	Sector Skill Council
SDMS	Skill Development Management System
SIP	Skill India Portal
HSE	Health Safety Environment
PPE	Personal Protective Equipment
PwD	Persons with Disability