



# Model Curriculum

**QP Name: Junior Mechanic (Engine)**

**QP Code: IES/Q1102**

**QP Version: 3.0**

**NSQF Level: 4**

**Model Curriculum Version: 1.0**

Infrastructure Equipment Skill Council (IESC), Jubilee Building (Second Floor), No.45, Museum Road,  
Bengaluru - 560025



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## Training Parameters

Sector	Infrastructure Equipment
Sub-Sector	Equipment Service and Spares
Occupation	Equipment Maintenance
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/ 7233.0701
Minimum Educational Qualification and Experience	Ability to Read and Write with 5 years of relevant experience OR 5th Class pass with 4 years of relevant experience OR 8th Class pass with 1 year of relevant experience OR 8th Class pass with 1 year of NTC/ NAC OR 8th Class pass and pursuing continuous schooling in regular school with vocational subject
Pre-Requisite License or Training	NIL
Minimum Job Entry Age	18 Years
Last Reviewed On	17/11/2022
Next Review Date	17/11/2025
NSQC Approval Date	17/11/2022
QP Version	3.0
Model Curriculum Creation Date	30/10/2022
Model Curriculum Valid Up to Date	17/11/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	300 Hours
Maximum Duration of the Course	300 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 be able to

- Describe the basic working principles of the engine.
- Explain the function of the engine components.
- Assist the Mechanic in performing daily and routine maintenance activities on the engine
- Assist the Mechanic in removal of the defective components, rectification and re-assembly.
- Assist the Mechanic in the troubleshooting of various problems.
- Clean the work area, tools and machinery after completion of the repair and maintenance job.
- Classify Environment, Health and Safety (EHS) 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
<b>Bridge Module</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>
<b>NOS Code – IES/N 1102</b> <b>NOS Name - Repairs &amp; Maintenance of Equipment's Engine</b> <b>NOS Version - 3.0</b> <b>NSQF Level – 3</b>	<b>25</b>	<b>65</b>	<b>30</b>	<b>0</b>	<b>120</b>
<b>NOS Code – IES/N 7801</b> <b>NOS Name – Maintain work area, tools and machinery</b> <b>NOS Version - 3.0</b> <b>NSQF Level - 3</b>	<b>25</b>	<b>65</b>	<b>30</b>	<b>0</b>	<b>120</b>
<b>NOS Code - IES/N 7602</b> <b>NOS Name - Comply with Workshop Health and Safety Guidelines</b> <b>NOS Version - 3.0</b> <b>NSQF Level - 4</b>	<b>10</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>30</b>

NOS Code - DST/VSQ/N0101 NOS Name - Employability Skills 30 hrs NOS Version-1.0	0	30	0	0	30
<b>Total Duration</b>	<b>60</b>	<b>180</b>	<b>60</b>	<b>0</b>	<b>300</b>

## Module Details

### Module 1: Orientation

#### Bridge Module

##### 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 Junior Mechanic - Engine.

<b>Duration:</b> <04:00>	<b>Duration:</b> <00:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the importance of skill training and bridging the skill gap to improve work efficiency.</li> <li>• Explain the roles and responsibilities of a Junior Mechanic Engine.</li> <li>• Understand and describe the scope of employment opportunities in the industry for a Junior Mechanic Engine Job role.</li> <li>• Describe different technical trainings conducted in SSC for multi skill an individual.</li> </ul>	NIL
<b>Classroom Aids:</b>	
Computer, projector, student table, whiteboard/flip chart, markers and duster	
<b>Tools, Equipment and Other Requirements</b>	

## Module 2: Repairs & Maintenance of Equipment's Engine

Mapped to NOS Code – IES/N 1102 v3.0

### Terminal Outcomes:

- Understand the basic working principle of an Engine.
- Explain the engine sub systems like Fuel system, Air system
- Assist the Mechanic in performing daily and routine maintenance activities on the engine
- Assist the Mechanic in employing suitable techniques for troubleshooting problems.
- Assist the Mechanic in removal of defective components, rectification and re-assembly.
- Read and understand the process of repair and maintenance of the equipment's engine system while assisting the Mechanic.

<b>Duration: &lt;30:00&gt;</b>	<b>Duration: &lt;90:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Should understand the basic functioning of the engine system.</li> <li>• Understand the function of the engine components.</li> <li>• Read the manufacturer's manual to understand the correct procedure for engine maintenance.</li> <li>• List the different kinds of maintenance activities to be performed on the engine.</li> <li>• Explain the importance of cleanliness while working with engine components.</li> <li>• Assist the Mechanic in selecting proper diagnostic tools for troubleshooting various problems.</li> <li>• Outline the correct sequence to troubleshooting engine problems while working with the Mechanic.</li> </ul>	<ul style="list-style-type: none"> <li>• Assist the Mechanic in daily and periodical maintenance of the engine system.</li> <li>• Assist the Mechanic while troubleshooting various problems in the engine.</li> <li>• Demonstrate correct procedure as per manufacturer's instructions when assisting the Mechanic to check the engine pressure.</li> <li>• Assist the Mechanic in repairing or replacing defective components.</li> <li>• Assist the Mechanic with dis-assembling and assembling the engine components inside workshop, when necessary.</li> </ul>
<b>Classroom Aids:</b>	
Computer, projector, printer, student table, whiteboard / flip chart, markers and duster	
<b>Tools, Equipment and Other Requirements</b>	
Diesel Engine 4 or 6 cylinder with Turbocharger & all related components, assemblies, accessories, standard tools and lab equipment for dis-assembly and assembly Manufacturer's Equipment Operation, Service and Repair Manual	

## Module 3: Maintain work area, tools and machinery

Mapped to NOS Code – IES/N 7801 v3.0

### Terminal Outcomes:

- Know the correct lifting and handling procedure for components
- Understand the different types of cleaning equipment and their uses.
- List the different types of machine guards for equipment.
- Explain the effects of contamination in oil and how to control it.
- Explain the importance of cleaning the tools, work area and machinery after completion of the job.

<b>Duration: &lt;30:00&gt;</b>	<b>Duration: &lt;90:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the correct lifting and handling procedures of components</li> <li>• Know about the different types of cleaning equipment and their usage.</li> <li>• List different types of machine guards for equipment.</li> <li>• Explain the effects of contamination in oil and list methods to control it.</li> <li>• List different ways to minimize waste generated while performing the cleaning activity.</li> <li>• Describe the importance of cleaning the tools, work area and machinery after completion of the job.</li> </ul>	<ul style="list-style-type: none"> <li>• Assist in keeping the work area clean &amp; hazard free.</li> <li>• Show how to maintain tools and equipment as per guidelines.</li> <li>• Demonstrate how to use machine safety guards.</li> <li>• Demonstrate the safe handling of tools, equipment and machinery.</li> <li>• Assist the Mechanic in carrying out cleaning as per schedule and limit of responsibility.</li> <li>• Show how to use the right cleaning material/equipment &amp; methods.</li> <li>• Assist the Mechanic in preparation of reports.</li> </ul>
<b>Classroom Aids:</b>	
Computer, projector, student table, whiteboard/flip chart, markers and duster Manufacturer’s Equipment Service and Repair Manual.	
<b>Tools, Equipment and Other Requirements</b>	

## Module 4: Workshop health and safety

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

- Describe the guidelines for health, safety and security requirements.
- Identify common hazards and risks at workplace.
- Employ safe practices to use diagnostic tools.
- Explain the emergency procedure to stop and shut down machinery.
- Perform basic first aid treatment for common injuries.
- Demonstrate the operation of firefighting equipment.
- Elaborate the guidelines for storage and disposal of hazardous materials and waste.
- Classify various safety signs, symbols and warnings used in work place

Duration: <10:00>	Duration: <20:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Describe the Health, safety, environmental (HSE) policies.</li> <li>• Explain the reporting procedure for all HSE activities</li> <li>• List down the contact details of HSE personnel, in case of emergencies.</li> <li>• Explain the emergency procedure to stop and shut down machinery.</li> <li>• Classify waste based on non-recyclable, hazardous and recyclable material.</li> <li>• Classify various safety signs, symbols and warnings used in the workplace.</li> <li>• Elaborate the guidelines for storage and disposal of hazardous materials and waste.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate the emergency procedure to stop and shut down machinery.</li> <li>• Identify common hazards and risks at workplace.</li> <li>• Employ safe practices to use the diagnostic tools.</li> <li>• Show the correct use of Personal Protective Equipment (PPE).</li> <li>• Demonstrate the operation of firefighting equipment.</li> <li>• Demonstrate the procedure to give basic first aid.</li> <li>• Prepare a hazard log register and report incidents and accidents.</li> <li>• Conduct a mock drill for dealing with emergencies like fire and other calamities.</li> </ul>
<b>Classroom Aids:</b>	
Computer, projector, printer, student table, whiteboard, flip chart, marker and duster	
<b>Tools, Equipment and Other Requirements</b>	
Fire Extinguishers, Personal Protective Equipment and other safety gears	



## Module 5: Employability Skills

Mapped to NOS: DST/VSQ/N0101

### 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
- 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
- Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws
- 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
- Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges
- Explain the significance of identifying customer needs and addressing them
- Create a biodata
- Use various sources to search and apply for jobs
- Discuss the significance of dressing up neatly and maintaining hygiene for an interview
- Discuss how to search and register for apprenticeship opportunities
- Describe opportunities as an entrepreneur

<b>Duration: &lt;00:00&gt;</b>	<b>Duration: &lt;30:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• NA</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss the importance of Employability Skills in meeting the job requirements</li> <li>• Show how to practice different environmentally sustainable practices</li> <li>• Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mind-set in different situations</li> <li>• Demonstrate how to communicate in a well -mannered way with others</li> <li>• Demonstrate working with others in a team</li> <li>• Show how to conduct oneself appropriately with all genders and PwD</li> <li>• Show how to operate digital devices and use the associated applications and features, safely and securely</li> <li>• Explain the significance of identifying customer needs and addressing them</li> <li>• Create a biodata</li> <li>• Use various sources to search and apply for jobs</li> <li>• Discuss the significance of dressing up neatly and maintaining hygiene for an interview</li> <li>• Describe opportunities as an entrepreneur</li> </ul>
<b>Classroom Aids:</b>	
Computer, projector, printer, student table, whiteboard/flip chart, marker, duster	
<b>Tools, Equipment and Other Requirements</b>	

# Annexure

## Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI		3	2	1		
Trainer Certification						
Domain Certification			Platform Certification			
Certified for Job Role: Junior Mechanic- Engine mapped to QP: IES/Q1103 – Version 2.0 Minimum accepted score 70%.			Certified for Job Role: Junior Mechanic- Engine Minimum accepted score 70%.			

## Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI		3	2	1		

Assessor Certification	
Domain Certification	Platform Certification
<p>Certified for Job Role: Junior Mechanic-Engine                      mapped to QP: IES/Q1103 – Version 2.0                      Minimum accepted score 70%.</p>	<p>Certified for Job Role: Junior Mechanic- Engine                      Minimum accepted score 70%.</p>

## 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 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
<b>Declarative Knowledge</b>	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.
<b>Key Learning Outcome</b>	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).
<b>OJT (M)</b>	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
<b>OJT (R)</b>	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
<b>Procedural Knowledge</b>	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.
<b>Training Outcome</b>	Training outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of the training.</b>
<b>Terminal Outcome</b>	Terminal outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of a module.</b> 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 disabilities