Model Curriculum

QP Name: Junior Tower Crane Operator

QP Code: IES/Q0110

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 Operation
Occupation	Junior Tower Crane Operator
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8343.0700
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:

- Explain the organization's operations, maintenance, and safety policies.
- Assist in preparing the base for Tower Crane.
- List the crane technical specifications, features, and performance.
- Determine the load characteristics including centre of gravity and lifting points.
- Identify common defects and general causes of breakdown.
- Describe the guidelines for health, safety and security requirements.

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/N 0167 NOS Name: Assist in Pre-lifting operations NOS Version - 2.0 NSQF Level - 3	**10**	**20**	**30**	**0**	**60**
NOS Code – IES/N 0168 NOS Name – Assist in tower crane operations NOS Version - 2.0 NSQF Level - 3	**30**	**60**	**30**	**0**	**120**
NOS Code - IES/N 0169 NOS Name - Assist in post lifting/handling operations NOS Version - 2.0 NSQF Level - 3	**10**	**20**	**30**	**0**	**60**
NOS Code - IES/N 7601 NOS Name - Comply with worksite health and safety guidelines NOS Version - 2.0 NSQF Level - 3	**10**	**20**	**0**	**0**	**30**
NOS Code - DST/VSQ/N0101	**0**	**30**	**0**	**0**	**30**

NOS Name- Employability Skills 30 hrs NOS Version- 1.0					
Total Duration	**60**	**150**	**90**	**0**	**300**

Module Details

Module 1: Orientation

Bridge Module

Terminal Outcomes:

- Describe the operations of the infrastructure industry in India.
- Outline the skill training schemes offered by Skill Sector Councils.
- Know about the different types of job roles available in IESC.
- Explain the roles and responsibilities of the Junior Tower Crane Operator.

Duration:*<4:00>*	**Duration**:*<0:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the employment opportunities in the industry. • Explain the roles and responsibilities of a Junior Tower Crane Operator. • Describe the different technical trainings conducted in SSC.	NIL
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster	
Tools, Equipment and Other Requirements	

Module 2: Assist in pre-op checks on Tower Crane

Mapped to NOS Code – IES/N0167 v 2.0

Terminal Outcomes:

- Explain the organization's operations, maintenance, and safety policies.
- Classify the hand tools used in material lifting activity and their application.
- Illustrate the steps to check for availability of lifting gears, tools and tackles prior to starting lifting.

- Assist in preparing the base for lifting equipment and load to be lifted as per requirement and instruction from the operator.
- Explain the responsibilities of the assigned job role.
- Understand how to record all repair activities in the equipment logbook.

Duration: <10:00>	**Duration**: <50:00>
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the required nature of base level required for equipment during lifting. • Summarize the fundamental functioning mechanism of weightlifting equipment such as cranes, winches, and so on. • Explain importance of ensuring that the equipment's structural components and assembly are located away from any overhead power or service lines. • Explain importance of checking and double-checking that the load is properly rigged to the sling according to the load's specifications. • Know basic measuring, geometry, and arithmetical calculation concepts. • Identify the tools and equipment in the tool kit, their uses and place of storage of the kit. • Explain the relationship between lifting tool and tackle specifications and load lifting requirements. • Know how to record information /observations on activities /incidents in accordance with the established standards. • Know how to read and understand basic signs, symbols, graphs, charts, and decals on equipment and at the job site. • Read and comprehend the essential elements of the equipment operation and maintenance manuals. • Know the escalation matrix for	• Demonstrate the procedure to examine wire rope slings, webbing slings, and chain slings. • Determine the weight of the load and the centre of gravity based on the weight of the load. • Show how to examine the location for blind spots and assess the clearance of the swing route. • Examine the work environment for barricading, signs, and the availability of needed PPEs, as specified by standard practice. • Set up and test communications for safe lifting operations with the crane operator. • Demonstrate the technique for guiding a suspended item to the site of construction using tag lines.

reporting unresolved problems. • Assist in planning and organising the work schedule in collaboration with the rest of the team and the supervisor.	
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual	
Tools, Equipment and Other Requirements	
Safety Gear, Tool Kit, PPE	

Module 3: Assist in Junior Tower Crane operations

Mapped to NOS Code – IES/N0168 v 2.0

Terminal Outcomes:

- Explain the organization's operational, maintenance, and safety policies.
- Elaborate the crane technical specifications, features, and performance.
- Determine the load characteristics including centre of gravity and lifting points.

Duration:<*30*:00>	**Duration**:<*90*:00>
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Outline the operational standards & maintenance and safety procedures followed in the Organization. • Explain the technical specifications of the tower crane, its limitations, and all the dynamics involved in crane and boom movement and lifting. • List out the factors that affect equipment stability, such as ground and supporting conditions. • Illustrate the actual and potential risks including overhead utilities and guide wires. • Learn how to communicate with the crane operator through lifting and manoeuvring the load using the communication device or by hand signalling.	• Demonstrate to identify and double-check the load's route, including distances, clearances, and landing location. • Employ the practise to guarantee load balance and stability by constantly monitoring the load. • Illustrate the steps to communicate with the crane operator and others on the jobsite while the cargo is landing. • Show how to analyse the load characteristics including centre of gravity and lifting points to determine the method of slinging. • Demonstrate how to ensure load balance and stability by constantly monitoring the load during the process. • Assist the site supervisor in cordoning off the lifting and lowering area using barricades,

• Identify and double-check the load's route before and during the lift, including distances, clearances, and landing location. • Know safety precautions to be taken to avoid damage.	where applicable, according to lifting plan requirements.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual	
Tools, Equipment and Other Requirements	
Safety Gear, Tool Kit, PPE	

Module 4: Assist in routine maintenance and troubleshooting

Mapped to NOS Code: IES/N0169 v 2.0

Terminal Outcomes:

- Outline the reporting structure of the company.
- Explain the basics of weight balancing.
- Identify common defects and general causes of breakdown.
- Assist in the replenishment of coolants, lubricants, and fluids.
- Illustrate the procedure to ensure that the main power is turned off from the panel of the tower crane.

Duration: <10:00>	**Duration**: <50:00>
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**

• Study the organization's operational, maintenance, safety and complaint resolution processes. • Explain basic signs, symbols, graphs, charts, and decals on equipment and at the job site. • Classify the types of motors and their uses. • Elaborate the fundamentals of electrical systems, including the control panel. • Explain the relevance of greasing all greasing pins, trolley pins, hoist and rope, and slewing bolts. • Know the scope of the position and when to escalate a problem to the operator/supervisor. • Describe common defects and general causes of breakdown and how to resolve them. • Describe the spill kit procedures.	• Demonstrate the procedure to service Jib/boom and mast. • Store the tools in the designated storage location after use. • Assist in servicing of electrical service system, hoisting system and stabilising system in accordance with the operator's instructions. • Show how to check the battery electrolyte levels and the tightness of the terminals and make adjustments as needed. • Assist in the replenishment of coolants, lubricants, and fluids in accordance with the machine's operation or the operational manual.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual	
Tools, Equipment and Other Requirements	
Safety Gear, Tool Kit, PPE	

Module 5: Health and safety

Mapped to NOS Code: IES/N 7601 v2.0

Terminal Outcomes:

- Describe the guidelines for health, safety and security requirements.
- Identify common hazards and risks at site.
- Employ safe practices to use the tools and machines.
- Explain emergency procedure to stop and shutdown machinery.
- Carry out basic first-aid treatment for common injuries.
- Demonstrate the operation of firefighting equipment.
- Describe the procedure for storage and disposal of hazardous materials and waste.
- Describe various safety signs, symbols and warnings used on site.

Duration: <10:00>	**Duration**: <20:00>

Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
• Describe the Health, safety, environmental (HSE) policies. • Explain the reporting procedure for all HSE activities. • List down the contact details of HSE personnel, in case of emergencies. • List the general safety rules for operating a Tower crane. • Classify waste based on non-recyclable, hazardous and recyclable material.	• Show the correct use of Personal Protective Equipment (PPE). • Follow the safe procedure to use the lift mechanism. • Demonstrate how to operate the fire extinguishers. • Demonstrate the procedure to give basic first aid. • Prepare a hazard log register and report incidents and accidents. • Conduct a mock drill for dealing with emergencies like fires and other calamities. • Demonstrate safe handling, storage and disposal of 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/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

Duration: **<00:00>**	**Duration**: **<30:00>**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• NA	• 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 • Show how to operate digital devices and use the associated applications and features, safely and securely • 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 • 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/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Class VIII		3	2	1		

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: Junior Tower Crane Operator Mapped to QP: IES/Q0123 Version2.0. Minimum accepted score 70%.	Certified for Job Role: Junior Tower Crane Operator Minimum accepted score 70%.

Assessor Requirements

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

Assessor Certification	
Domain Certification	**Platform Certification**
Certified for Job Role: Junior Tower Crane Operator Mapped to QP: IES/Q123–Version2.0 Minimum accepted score 70%.	Certified for Job Role: Junior Tower Crane Operator Minimum accepted score 70%.

Assessment Strategy

Criteria for assessment for Qualification Pack have 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 disabilities