



Model Curriculum

QP Name: Drone Operator – Over-Dimensional Cargo

QP Code: LSC/Q0403

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

Table of Contents

Training Parameters.....	2
Program Overview	3
Training Outcomes.....	3
Compulsory Modules.....	3
Module 1: Introduction to Drone Operator – ODC.....	5
Module 2: Preparation of drone for ODC monitoring	6
Module 3: Drone flight stimulation and flight testing	7
Module 4: Repair and maintenance of the drone	8
Module 5: Monitoring ODC loading and unloading.....	9
Module 6: Drone operations during ODC transportation.....	10
Module 7: Compliance to health and safety standards.....	11
Module 8: Employability Skills.....	12
Annexure.....	14
Trainer Requirements	14
Assessor Requirements.....	15
Assessment Strategy.....	16
References	18
Glossary.....	18
Acronyms and Abbreviations.....	19

Training Parameters

Sector	Logistics
Sub-Sector	Land Transportation
Occupation	Engineering/Maintenance, Transport Operations
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3139.9900 & ISCO-08/3139
Minimum Educational Qualification and Experience	12th grade pass OR Completed 2nd year of 3-year diploma (after 10th) and pursuing a regular diploma OR 10th Grade Pass + 2 years of relevant experience in warehousing/ transportation. OR Previous relevant Qualification of NSQF Level 3.0 (Transportation) with minimum education as 8th Grade pass + 3 years of relevant experience
Pre-Requisite License or Training	Drone Pilot License
Minimum Job Entry Age	18
Last Reviewed On	03/05/2023
Next Review Date	03/05/2026
NSQC Approval Date	03/05/2023
QP Version	1.0
Model Curriculum Creation Date	03/01/2023
Model Curriculum Valid Up to Date	03/05/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	540
Maximum Duration of the Course	540

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 will be able to:

- Discuss the various functions of a drone operator – ODC
- Detail the steps for preparing the drone for ODC monitoring
- Demonstrate the appropriate steps for conducting drone flight stimulation and flight testing as per SOP
- Demonstrate the steps to be performed in assembling and preparing of drone as per SOP
- Detail the appropriate steps for conducting drone flight stimulation and flight testing as per SOP
- Perform the essential steps for repair and maintenance of drones
- Detail the steps to be followed for effective monitoring of ODC loading and unloading
- Demonstrate the process of effective ODC monitoring during transit
- Detail the various safety and health precautions to be followed during drone operations for ODC

Compulsory Modules

The table lists the modules, their duration and mode of delivery.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	20	10			30
Module 1: Introduction to Drone Operator - ODC	20	10			30
LSC/N0416 – Prepare for monitoring over dimensional cargo using drone V1.0 NSQF Level 4	20	35	5		60
Module 2: Preparation of drone for ODC monitoring	20	35	5		60
LSC/N0408 – Carry out drone flight simulation and test flight	20	60	10		90

V2.0 NSQF Level 4					
Module 3: Drone flight stimulation and flight testing	20	60	10		90
LSC/N0417 – Carry out repair and maintenance of the drone V2.0 NSQF Level 4	20	35	5		60
Module 4: Repair and maintenance of drones	20	35	5		60
LSC/N0418 - Monitor ODC during loading and unloading V1.0 NSQF Level 4	20	65	5		90
Module 5: Monitoring ODC loading and unloading	20	65	5		90
LSC/N0419 - Monitor ODC during transit and support in improving transportation of ODC V1.0 NSQF Level 4	20	65	5		90
Module 6: Drone operations during ODC transportation	20	65	5		90
LSC/N0420 – Maintain health and safety during drone operations for ODC monitoring V1.0 NSQF Level 4	20	40			60
Module 7: Compliance to health and safety standards	20	40			60
Employability Skills DGT/VSQ/N0102	30	30			60
Total Duration	170	340	30		540

Module Details

Module 1: Introduction to Drone Operator – ODC

Mapped to Bridge Module

Terminal Outcomes:

- Describe the basic structure and function of supply chain
- Detail the various functions of a drone operator - ODC

Duration: 20:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Classify the components of supply chain and logistics sector • Detail the various sub-sectors and the opportunities in them • Illustrate the job role of a drone operator – and its connection with various other job roles • Describe the various activities in a transportation 	<ul style="list-style-type: none"> • Identify the various MHEs used in loading unloading of goods • Perform various operations functions of a drone operator
Classroom Aids	
Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser	
Tools, Equipment and Other Requirements	
Personal Protective Equipment (PPEs), Drone	

Module 2: Preparation of drone for ODC monitoring

Mapped to LSC/N0416, v1.0

Terminal Outcomes:

- Demonstrate the process of assembling the drone as per SOP
- Assess the various ODC project requirements concerning material involved, loading, unloading etc.
- Perform route survey for ODC transportation as per SOP

Duration: 20:00	Duration: 35:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the drone assembly procedure and the safety measures to be followed. • Detail the troubleshooting methods and the pre-flight checks to be conducted on the drone • Explain the damage and repair process for drones. • Detail the documentation process for the pre-flight checks conducted on the drone • Describe the ODC transportation project requirements in terms of material involved, dimensions, weight, volume, ODC loading, unloading process, lashing requirements based on the centre of gravity, stability required, etc. • Describe route planning process. • Elaborate the procedures to conduct a route survey and the steps to be followed while executing. 	<ul style="list-style-type: none"> • Assemble the drone according to the manufacturer’s manual and safety precautions. • Demonstrate the various pre-flight checks to be conducted on the drone • Perform appropriate troubleshooting as and when required • Prepare and store relevant documentation concerning the pre-flight checks conducted on the drone. • Obtain necessary approvals, certifications for deploying drones on ODC-related logistics operations • Assess the ODC transportation requirements concerning material involved, dimensions, weight, volume, ODC loading and unloading, lashing requirements based on the centre of gravity, stability required, etc.
Classroom Aids	
Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser	
Tools, Equipment and Other Requirements	
Drone, User Manual,	

Module 3: Drone flight stimulation and flight testing

Mapped to LSC/N0408, v1.0

Terminal Outcomes:

- Detail the appropriate steps for conducting drone flight stimulation as per SOP
- Demonstrate the appropriate steps for flight testing as per SOP

Duration: 20:00	Duration: 60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the steps to be performed for stimulating the drone flight • Detail the steps to be performed for undertaking drone test flight • List the important parameters and features to be tested • Detail the safety precautions to be followed while test-flying the drone • Discuss the process of recording necessary data regarding drone test flight. 	<ul style="list-style-type: none"> • Demonstrate the steps to be performed for stimulating the drone flight • Perform drone demo flight in the drone flight stimulator • Perform testing of all important parameters and features while flight testing • Demonstrate the safety precautions while test flying the drone • Record necessary data regarding drone test flight
Classroom Aids	
Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser	
Tools, Equipment and Other Requirements	
Personal Protective Equipment (PPEs), Drone	

Module 4: Repair and maintenance of the drone

Mapped to LSC/N0417, v1.0

Terminal Outcomes:

- Repair and maintain the drone
- Coordinate with the drone manufacturer
- Maintain the record of repair and maintenance

Duration: 20:00	Duration: 35:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Detail the steps to be followed for maintenance and repair of drones. • Describe the damage process of coordinating with the drone manufacturer • Explain record keeping procedure for drone maintenance and repair. 	<ul style="list-style-type: none"> • Prepare the drone for maintenance by following the steps. • Follow the steps for drone maintenance and record the repairs. • Perform maintenance, repair activities on drone and record the same. • Coordinate with the drone manufacturer for repairs and replacement to be done from their end. • Follow the recommended maintenance schedule for different drone components • Maintain and analyze the records concerning the drone’s repair and maintenance to identify and resolve recurring issues
Classroom Aids	
Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser	
Tools, Equipment and Other Requirements	
Drone, User Manual, camera	

Module 5: Monitoring ODC loading and unloading

Mapped to LSC/N0418, v1.0

Terminal Outcomes:

- Detail the steps to be followed for effective monitoring of ODC loading and unloading

Duration: 20:00	Duration: 65:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe ODC loading procedure. • Explain ODC loading activities and plan the use of drone accordingly • Detail the steps to be performed while monitoring ODC during loading and unloading • Detail documentations concerning the loading and unloading activities. 	<ul style="list-style-type: none"> • Perform drone operations during ODC loading. • Prepare checklist for the parameters to be checked during ODC loading and perform the checks. • Monitor ODC during unloading • Prepare checklist for the parameters to be checked during ODC unloading and perform the checks. • Assist in carrying out documentation concerning the loading and unloading activities, providing information concerning the drone’s use and data captured by it, e.g. images and videos
Classroom Aids	
Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser	
Tools, Equipment and Other Requirements	
Drone, User Manual, camera	

Module 6: Drone operations during ODC transportation

Mapped to LSC/N0419, v1.0

Terminal Outcomes:

- Demonstrate the process of effective ODC monitoring during transit
- Recommend appropriate risk mitigation measures

Duration: 20:00	Duration: 65:00
<p>Theory – Key Learning Outcomes</p> <ul style="list-style-type: none"> • Describe the drone operations during ODC transportation. • Detail the laws for using drones in logistics operations • Explain the records to be maintained for ODC monitoring. • Elaborate the assistance provided by drones during ODC transit. • Describe compliances applicable with environmental safety, occupational health and safety regulations, e.g. ISO-14001 and ISO-18001, during the transportation of ODC • Explain the risk mitigations involved during ODC transit and the measures to be taken. 	<p>Practical – Key Learning Outcomes</p> <ul style="list-style-type: none"> • Use Artificial Intelligence (AI) based drones for autonomous flight for easy operation and increased accessibility • Perform drone operations steps to be followed during ODC transportation. • Adhere to the applicable laws for using drones in logistics operations. • Maintain the relevant records concerning the monitoring of ODC using a drone. • Assist in ensuring compliance with the applicable environmental safety and occupational health and safety regulations, e.g. ISO-14001 and ISO-18001, during the transportation of ODC • Evaluate risk mitigation measures • Assist in the implementation of the identified risk mitigation measures, checking their implementation and efficacy using drone
Classroom Aids	
Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser	
Tools, Equipment and Other Requirements	
Drone, User Manual, camera	

Module 7: Maintain health and safety during drone operations for ODC

Mapped to LSC/N0420, v1.0

Terminal Outcomes:

- Detail the various safety and health precautions to be followed during drone operations for ODC

Duration: 20:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the drone safety regulations applicable in the area of operation • Explain the appropriate measures for the weatherproofing of the drone, e.g. cover the sensitive electronic parts with silicone conformal coating and the parameters for suitable drone operating environment. • Elaborate on the steps to be followed for maintaining the health and safety during drone operations. • Explain the requirement for relevant Personal Protection Equipment (PPE) • Describe the sanitization procedures to be followed. • Explain unsafe conditions, practices at work and their preventive measures • Detail the measures to be followed with readiness for relevant health emergencies 	<ul style="list-style-type: none"> • Determine and follow the relevant drone safety regulation applicable in the area of operation • Adhere to the selected drone’s tolerance limits • Follow the appropriate measures for the weatherproofing of the drone and operating in a safe environment. • List down the safety measures for drone operations and follow the same. • Maintain the drone at an appropriate distance from ODC during operation to ensure good visibility of ODC and prevent potential damage to the drone • Follow personal health and safety measures while handling heavy objects. • Maintain appropriate preparedness to deal with emergencies at work • Follow the organizational policy to deal with emergencies such as fire, accidents, disease outbreaks or natural calamities
Classroom Aids	
Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser	
Tools, Equipment and Other Requirements	
Personal Protective Equipment (PPEs), Drone, User Manual	

Module 8: Employability Skills

Mapped to DGT/VSQ/N0102, v1.0

Terminal Outcomes:

- Discuss the Employability Skills required for jobs in various industries
- Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
- Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan

Duration: 30:00	Duration: 30:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the Employability Skills required for jobs in various industries • List different learning and employability related GOI and private portals and their usage • Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen • Discuss importance of relevant 21st century skills. • Describe the benefits of continuous learning. • Explain the importance of active listening for effective communication • Discuss the significance of working collaboratively with others in a team • Discuss the significance of escalating sexual harassment issues as per POSH act. • List the common components of salary and compute income, expenditure, taxes, investments etc. • Discuss the legal rights, laws, and aids • Describe the role of digital technology in today's life • Discuss the significance of displaying responsible online behaviour while browsing, using various social media platforms, e-mails, etc., safely and securely 	<ul style="list-style-type: none"> • Practice different environmentally sustainable practices. • Exhibit 21st century skills like Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life. • Demonstrate to use basic English sentences for everyday conversation in different contexts, in person and over the telephone • Read and interpret text written in basic English • Write a short note/paragraph / letter/e - mail using basic English • Create a career development plan with well-defined short- and long-term goals • Communicate effectively using verbal and nonverbal communication etiquette. • Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD • Outline the importance of selecting the right financial institution, product, and service • Demonstrate how to carry out offline and online financial transactions, safely and securely • Operate digital devices and use the associated applications and features, safely and securely

- | | |
|---|---|
| <ul style="list-style-type: none"> • Explain the types of entrepreneurship and enterprises • Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan • Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement • Detail the significance of analysing different types and needs of customers • Explain the significance of identifying customer needs and responding to them in a professional manner. • Discuss the significance of maintaining hygiene and dressing appropriately • Explain the significance of maintaining hygiene and confidence during an interview • List the steps for searching and registering for apprenticeship opportunities | <ul style="list-style-type: none"> • Create sample word documents, excel sheets and presentations using basic features • Utilize virtual collaboration tools to work effectively • Devise a sample business plan, for the selected business opportunity • Create a professional Curriculum Vitae (CV) • Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively • Perform a mock interview |
|---|---|

Classroom Aids

Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser, UPS, LCD Projector, Computer Tables & chairs

Tools, Equipment and Other Requirements

Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below), Scanner cum Printer

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
12 th Pass		3	Drones	1	Drones	

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Drone Operator – Over Dimensional Cargo ” mapped to QP: “LSC/Q0403, V1.0”. Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: “Trainer (VET and Skills)”, mapped to the Qualification Pack: “MEP/Q2601, V2.0”. Minimum accepted score is 80%

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
12 th Pass	NA	2	Drones	1		

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Drone Operator – Over Dimensional Cargo ” mapped to QP: “LSC/Q0403, V1.0”. Minimum accepted score is 80%	Recommended that the Assessor is certified for the Job Role: “Assessor (VET and Skills)”, mapped to the Qualification Pack: “MEP/Q2701, V2.0” with Minimum score of 80%

Assessment Strategy

The emphasis is on 'learning-by-doing' and practical demonstration of skills and knowledge based on the performance criteria. Accordingly, assessment criteria for each job role is set and made available in qualification pack.

The assessment papers for both theory and practical would be developed by Subject Matter Experts (SME) hired by Logistics Sector Skill Council or with the LSC accredited Assessment Agency as per the assessment criteria mentioned in the Qualification Pack. The assessments papers would also be checked for the various outcome-based parameters such as quality, time taken, precision, tools & equipment requirement etc.

Each NOS in the Qualification Pack (QP) is assigned a relative weightage for assessment based on the criticality of the NOS. Therein each Element/Performance Criteria in the NOS is assigned marks on relative importance, criticality of function and training infrastructure.

The following tools would be used for final assessment:

1. Practical Assessment: This comprises of a creation of mock environment in the skill lab which is equipped with all equipment required for the qualification pack.

Candidate's soft skills, communication, aptitude, safety consciousness, quality consciousness etc. is ascertained by observation and marked in observation checklist. The outcome is measured against the specified dimensions and standards to gauge the level of their skill achievements.

2. Viva/Structured Interview: This tool is used to assess the conceptual understanding and the behavioral aspects with regard to the job role and the specific task at hand. It also includes questions on safety, quality, environment, and equipment etc.

3. On-Job Training: OJT would be evaluated based on standard log book capturing departments worked on, key observations of learner, feedback and remarks of supervisor or mentor.

4. Written Test: Question paper consisting of 100 MCQs (Hard:40, Medium:30 and Easy: 30) with questions from each element of each NOS. The written assessment paper is comprised of following types of questions:

- i. True / False Statements
- ii. Multiple Choice Questions
- iii. Matching Type Questions
- iv. Fill in the blanks
- v. Scenario based Questions
- vi. Identification Questions

QA Regarding Assessors:

Assessors are selected as per the "eligibility criteria" laid down by LSC for assessing each job role. The assessors selected by Assessment Agencies are scrutinized and made to undergo training and introduction to LSC Assessment Framework, competency based assessments, assessors guide etc. LSC conducts "Training of Assessors" program from time to time for each job role and sensitize assessors regarding assessment process and strategy which is outlined on following mandatory parameters:

- 1) Guidance regarding NSQF
- 2) Qualification Pack Structure
- 3) Guidance for the assessor to conduct theory, practical and viva assessments
- 4) Guidance for trainees to be given by assessor before the start of the assessments.
- 5) Guidance on assessments process, practical brief with steps of operations
practical observation checklist and mark sheet
- 6) Viva guidance for uniformity and consistency across the batch.
- 7) Mock assessments
- 8) Sample question paper and practical demonstration

References

Glossary

Term	Description
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
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