# Model Curriculum

**QP Name: Kisan Drone Operator**

**QP Code: AGR/Q1006**

**Version: 3.0**

**NSQF Level: 3**

**Model Curriculum Version: 3.0**

Agriculture Skill Council of India || Unit No. 101, First Floor, Greenwoods Plaza,

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# Training Parameters

| | |
|---|---|
| Sector | Agriculture |
| Sub-Sector | Agriculture Crop Production |
| Occupation | Precision Farming |
| Country | India |
| NSQF Level | 3 |
| Aligned to NCO/ISCO/ISIC Code | NCO-2015/ 7233.2800, 7233.9900 |
| Minimum Educational Qualification and Experience | Grade 10 Pass |
| Pre-Requisite License or Training | • No License required, DGCA approved RPTO provides Remote Pilot Certificate (RPC) to candidates who clear the flying examination taken by DGCA certified instructor<br>• Candidate to be trained and assessed on AGR/N1039 at RPTO as per DGCA guidelines |
| Minimum Job Entry Age | 18 Years |
| Last Reviewed On | 03/05/2023 |
| Next Review Date | 15/03/2027 |
| NSQC Approval Date | 15/03/2024 |
| QP Version | 3.0 |
| Model Curriculum Creation Date | 02/02/2024 |
| Model Curriculum Valid Up to Date | 15/03/2027 |
| Model Curriculum Version | 3.0 |
| Minimum Duration of the Course | 270 Hours |
| Maximum Duration of the Course | 270 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 to:

- Identify the job role of Kisan Drone Operator
- Plan appropriate route for drone operation.
- Set up the drone for operation.
- Demonstrate the ATC procedures and Radiotelephony
- Compare Fixed-wing, Rotorcraft & Hybrid UAVs
- Identify appropriate conditions for drone operations.
- Identify & select different types of Drones and illustrate Fundamentals of Flight (Aerodynamics).
- Interpret DGCA Safety Regulations & observe safety guidelines, ATC procedures & Radio Telephony, Weather and meteorology as a Drone Pilot in flying a Drone.
- Identify & select different Airframes & Propellers in drone flying.
- Explain & apply knowledge of Power systems viz. Electric motors, Batteries, chargers, Connectors etc. in drone flying
- Carry out drone flying as per the requirement
- Demonstrate the process of post operation drone maintenance
- Demonstrate the process of collecting, and analysing the required data
- Prepare reports based on the analyzed data
- Demonstrate basic assembly and disassembly procedures for drones
- Demonstrate the procedure for flight simulation
- Demonstrate various flying techniques
- Demonstrate measures for storage of pesticides/crop nutrients
- Plan the agricultural enterprise/ business.
- Identify employability opportunities
- Describe the process of managing the entrepreneurial activities.
- Describe how to comply with rules and regulations
- Adhere precautionary measures before, during and post-operation for drone-based pesticide application
- Determine soil fertility using drone sensors
- Discuss how to adhere to personal hygiene practices.
- Demonstrate ways to ensure cleanliness around the workplace

## 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 |
|---|---|---|---|---|---|
| **AGR/N1039: Undertake drone flying ensuring adherence to laws/procedures (To be assessed at the RPTO as per the DGCA rules/regulations)**<br>**NOS Version- 1.0**<br>**NSQF Level- 3** | **20:30** | **9:30** | **0:00** | **0:00** | **30:00** |
| Module 1: Introduction to the role of Kisan Drone Operator | 05:50 | 00:00 | 0:00 | 0:00 | 05:50 |
| Module 2: Drone Flying ensuring adherence to laws/procedures | 14:40 | 9:30 | 0:00 | 0:00 | 24:10 |
| **AGR/N1030: Carry out drone based pesticide and crop nutrient application**<br>**NOS Version- 2.0**<br>**NSQF Level- 3** | **15:00** | **45:00** | **00:00** | **0:00** | **60:00** |
| Module 3: Application of pesticides and nutrients with drones | 15:00 | 45:00 | 00:00 | 0:00 | 60:00 |
| **AGR/N1020: Ensure adherence of precautionary measures before, during and post-operation for drone based pesticide application**<br>**NOS Version- 2.0**<br>**NSQF Level- 3** | **30:00** | **30:00** | **00:00** | **0:00** | **60:00** |
| Module 4: Safety and emergency procedures before and after pesticide spraying through drone operation | 30:00 | 30:00 | 00:00 | 0:00 | 60:00 |
| **DGT/VSQ/N0101 Employability Skills**<br>**NOS Version- 1.0**<br>**NSQF Level-3** | **30:00** | **00:00** | **0:00** | **0:00** | **30:00** |
| Module 5: Employability Skills | 30:00 | 00:00 | 0:00 | 0:00 | 30:00 |
| **Total Duration** | **95.30** | **84.30** | **90:00** | **0:00** | **270:00** |

# Module 1: Introduction to the role of Kisan Drone Operator

***Mapped to AGR/N1039 v1.0***

**Terminal Outcomes:**

- Discuss the job role of Kisan Drone Operator
- Explain Scope and Avenues of Kisan Drones
- Identify the employment opportunities as Kisan drone operator

| **Duration: 05:50** | **Duration: 0:00** |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • Describe the scope of Drones in agriculture industry<br>• Discuss the role and responsibilities of an Kisan Drone Operator<br>• Identify various employment opportunities for a Kisan Drone Operator<br>• Discuss about RPTO<br>• Discuss about Cat-1[VLOS] remote Pilate certifications<br>• Discuss about UAS types, categorization and their limits<br>• Explain Digital Sky and how does it work<br>• Discuss UIN and DAN | |
| **Classroom Aids** | |
| Training Kit - Trainer guide, Power Point Presentation, White board, Marker, Projector, Laptop, Videos etc. | |
| **Tools, Equipment and Other Requirements** | |
| NA | |

# Module 2: Drone flying ensuring adherence to laws/procedures

***Mapped to AGR/N1039 v1.0, DGCA Syllabus****

***(*The training on this module is to be conducted at the RPTO as per DGCA rules/ regulations)***

**Duration: 30:00**

**Key Learning Outcomes**

**THEORY:**

**Stakeholders & their laws [Basic] Drone Rules 2021: 1:30 Hours**

After completing this programme, participants will be able to:

1. International Rules, Regulations, Standards & Practices
2. Civil Aviation Requirements, AIPs, NOTAM
3. Classification & Categorization of drones
4. Type Certification of Drones
5. Registration, Sale & De-Registration of Drones
6. Operations of Drones
7. Dos and Donts
8. Remote Pilot Certificate
9. Drone Insurance

**Basic principles of flight: 1:00 Hours**

10. Fundamentals of flight
11. Aerodynamics
12. Take-off, flight, and landing
13. Maneuvers, turns and circuit pattern

**ATC procedures & Radio Telephony (non FRTOL): 1:15 Hours**

14. Understanding ATC operations
15. Airspace structure and Airspace
16. Restrictions with knowledge of no drone zones
17. Flight regulations and procedures in Yellow Zone
18. RT Phraseology & Communicating with ATC including Position and Altitude Reporting ;
19. Flight Planning Procedures including Altimeter setting procedures
20. Collision avoidance
21. Radio Telephony (RT) techniques

**Fixed-wing Operations and Aerodynamics: 1:15 Hours**

22. Types of fixed wing drones, make, parts, terminology
23. Operation and maneuvers of fixed wing drones, Flight Performance
24. Intro to Mission Planning, Instrument Flying & Navigation (GCS)
25. Applications of fixed-wing UAVs
26. Pros and Cons of Fixed Wing Drones

**Rotorcraft Operations and Aerodynamics: 1:30 Hours**

27. Basic drone terminology & parts
28. Types of drones, material used and size of drones

29. Drone Anatomy: Different parts of drones
30. Avionics & C2 Link
31. Intro to Mission Planning, Instrument Flying & Navigation (GCS)
32. Applications and operations of Multirotor, Flight Performance
33. Pros and Cons of Rotorcraft Drones

**Hybrid Operations and Aerodynamics: 0:30 Hours**

34. Principles of Aerodynamics
35. Types of Hybrid Drones & Parts
36. Intro to Mission Planning, Instrument Flying & Navigation (GCS)
37. Applications of Hybrid UAVs
38. Comparison with Rotorcraft & Aeroplane

**Weather and Meteorology: 1:15 Hours**

39. The standard atmosphere
40. Measuring air pressure
41. Heat and temperature
42. Wind
43. Moisture, cloud formation, icing and its effects
44. Effect of atmosphere on RPAS operation & hazardous weather avoidance
45. Met Terminal Aviation Routine Weather Report (METAR)

**Drone Equipment Maintenance: 1:30 Hours**

46. Maintenance of drone, flight control box, ground station
47. Maintenance of ground equipment, batteries and payloads
48. Scheduled servicing
49. Repair of equipment
50. Fault finding and rectification

**Risk Assessment & Analysis - Safety Management / TEM: 1:30 Hours**

51. Drone Emergency & Handling
52. Loss of C2-link
53. Fly-aways (Straying)
54. Loss of power
55. Other Emergencies
56. Human Performance & Pilot Incapacitation
57. Fail-Safe Features

**Payload, Installation and Utilization: 1:15 Hours**

58. Types of payloads - What to carry, what not to carry
59. Parts of payloads
60. Installation
61. Features of payloads
62. Utilization

**Intro to Drone Data & Analysis: 1:30 Hours**

63. Principles of Observation
64. Elements of Image & Video Interpretation
65. Introduction to Photogrammetry
66. Types of Image & Video Data

67. Analysis

**Final Test Theory: 0:40 Hours**

**PRACTICAL:**

**Flight Simulator Training: 2:45 Hours**

1. Introduction to Flight Simulator
2. Sim familiarization, Controls check
3. Pre-flight checks, Take off, Cruise
4. Approach. Go-around & Landing, Post-Flight Checks
5. Cruise and Turns, Climbing and Climbing Turns
6. Descend & Descending Turns
7. Disorientation & Recovery
8. Circuit Flying – Rectangle/ Square/ Circle / Orbit, Flying – Figure of 8
9. Gimbal Controls (Pan, tilt & zoom)
10. Night Flying
11. Abnormal / Emergency Procedures

**SIMULATOR TEST: 0:15 Hours**

**Basic Assembly & Maintenance: 2:00 Hours**

12. Assembling of drone
13. De-assembling
14. Integration of sub-sections/ modules
15. Integration of engine/propulsion system
16. Fault finding and rectification
17. Repair maintenance and documentation

**Practical Flying with Instructor/ Solo Flying: 4:10 Hours**

18. Intro to Digital Sky platform
19. RPAS familiarization & Safety briefing
20. Introductory flight where the student experiences sensitivity of controls and learning the orientation of the RPA
21. Take-off, Climbing, descending and maintaining height
22. Basic Controls: Pitch, Roll and Yaw
23. Disorientation & Recovery
24. Progress Check - Multirotor
25. Level turns in both directions
26. Climbing and descending turns
27. Left and right square circuits patterns
28. Flying in circles
29. Flying in figure of 8
30. Mission Planning & Instrument Flying
31. Auto Mission & Flight
32. Night Flying
33. Abnormal/ Emergency procedures

**FINAL TEST- MULTIROTOR: 0:20 Hours**

**Tools, Equipment and Other Requirements:**

Small/Medium VLOS Agriculture Drone, Simulator, Open ground 500 Sq.mts
Instructor to be DGCA Certified

## Module 3: Application of pesticides and nutrients with drones

*Mapped to ARG/N1030 v2.0*

**Terminal Outcomes:**

- Describe how to prepare the drone for application of pesticides and fertilizers
- Demonstrate application of pesticides and fertilizers using the drone
- Determine soil fertility using various sensors of drone
- Describe the ways to safeguard non-targeted areas during drone operation
- Demonstrate measures for storage of pesticides/crop nutrients
- Demonstrate general maintenance practices post drone operation

| Duration: 15:00 | Duration: 45:00 |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • Explain Principles of pesticide Applications-Basic Principles, Drone Sop and Policy issues<br>• Explain about type of drone, parts of Agri drone, battery and their replacement, spray tank and balancing, Nozzle replacement etc.<br>• Explain about obstacles in the area of operation for necessary mapping software adjustments<br>• Explain Critical parameter in Spraying viz drone parameter, Agrochemical parameter, environmental issues, operational Parameter, Non Target applications etc.<br>• Discuss about Nozzles and their use, type of nozzles, their classification, droplet measures, calibration of nozzle<br>• Explain the the process of using drones to apply fertilisers, herbicides, pesticides and insecticides uniformly at the identified sites in the field<br>• Explain about formulations and their types, various compatibility issues, formulation management and efficacy evaluation, dosage requirements etc.<br>• Explain about Various types of spray equipment viz. High/Low/Ultra Low volume application equipment<br>• Explain about various documentation requirements of the organization<br>• Explain the process of obtaining the necessary regulatory approvals to use a | • select appropriate drones which can carry suitably sized reservoirs, which can be filled with fertilizers, herbicides, or pesticides for crop spraying<br>• identify appropriate software and technology with reference to different farming practices for drone utilization in various agriculture activities<br>• Show how to attach the nozzle system in an efficient manner for continuity in spray swath during spray from minimum permitted height above the uniformly distributed crop<br>• Set the drone software to self-adjust its altitude and speed for spraying on desired height above the crop<br>• Track the fields and fix the coordinates appropriately<br>• Demonstrate the use of GPS and map accuracy of the drone to demarcate the target area boundary and safety/buffer margins<br>• plan the appropriate route for the drone operation<br>• demonstrate how to check obstacle presence in the area of operation and make necessary mapping and adjustments in software or peripherals<br>• Demonstrate the procedure to adjust row spacing, row number, borders indentation, obstacle boundary distance, route type with available software<br>• Inspect the drone for leakage of |

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| drone for agricultural operations<br>• Explain spray dynamics, spray volume, droplet size, concentration, drift mechanism, specific nozzles, delivery mechanism and pressure<br>• Explain how to load pesticide/ fertilizer on the drone according to its payload capacity<br>• Explain how to use a drone to apply pesticides and fertilizers uniformly over an agricultural field<br>• List approved agrochemicals by Central Insecticides Board and Committee (CIB&RC)<br>• Explain recommended dose of agrochemical for the crops and their droplet size for bio efficacy<br>• Explain agrochemical(liquid/solid) compatibility with the drone spray system and their dilution requirements<br>• Explain CIB&RC specified guidelines for mixing of agrochemicals<br>• Explain about active ingredients dosage/ha and PHI interval<br>• Compare drone sprayers with other sprayers<br>• Explain how to attach the nozzle system in an efficient manner for continuity in spray swath during spray<br>• Explain how to make appropriate setting in drone software to self-adjust its altitude and speed for spraying on desired height above the crop<br>• Explain How to ensure GPS and map accuracy of the drone to demarcate the target area boundary and safety/buffer margins<br>• Explain general principle of calibration<br>• Explain how to Calibrate handheld/vehicle mounted sprayer and drone spray system<br>• Explain agrochemical safety guidelines prescribed by the manufacturer for their safe handling<br>• Explain recommended agro-chemical | pesticides/agrochemicals<br>• calibrate the drone spray system to ensure recommended accuracy on amount of input to be sprayed<br>• Inspect the field to know the extent of pest/disease/weeds infestation<br>• select /use the agrochemicals duly approved by Central Insecticide Board and Registration committee<br>• plan the chemical spraying as per the spraying schedule at various / critical crop growth and infestation stages as per crop protection guidelines<br>• demonstrate the dilution of agrochemical in clean water as per recommendations by the manufacturing company using appropriate PPE<br>• Demonstrate the crop spraying in safer and cost-effective way by its autonomous and pre-programmed on specific schedules and routes.<br>• Demonstrate the operation of drone to apply soil/crop nutrients in the form/concentration of the nutrients being sprayed/ broadcasted using sensors/ spraying systems installed<br>• Ensure efficient fertigation use of water using drone (depending on the sprayer system of the drone)<br>• Demonstrate the use different kinds of sprayer nozzles depending on the form and concentration of the nutrients to be applied<br>• Evaluate residue and bio efficacy effects<br>• Demonstrate the use of available advance feature of the software for accurate movement of drone and its control as per manifested various parameters like battery discharge or low voltage in the area operation<br>• identify and resolve common error messages and corrections by debugging of Software appropriately<br>• demonstrate how to set the drone to home position post completion of task<br>• Demonstrate the measures to Safeguard |

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| doses for specific crops<br>• Explain recommended spray schedule at various/ critical crop growth and infestation stages as per crop protection guidelines and phytotoxic assessment<br>• Explain dilution methods of the agrochemical as per recommendations<br>• Explain how to perform crop spraying in safer and cost-effective way<br>• Explain troubleshooting for common malfunctions as per the manufacturer's instructions<br>• Explain ways to minimize spray drift in non-target field<br>• Explain the hazardous effect of agri Inputs/chemicals<br>• Explain Critical operational parameters for drift management<br>• Explain Importance of emergency eyewash and emergency drench showers and absorbent spill kits within or near storage areas<br>• Explain how to dispose excess/ obsolete materials and chemicals in accordance with manufacturers recommendation and state law<br>• Explain about spares and accessories, maintenance of battery<br>• Explain different type of nozzles, their functions and maintenance<br>• Differentiate between Recommended dose of fertilizer (RDF) protocol and real-time operation protocol<br>• Explain how to prepare report in graphical or tabular form as per client requirement<br>• Explain various ICT-driven tools and technologies in agriculture and allied sector<br>• Explain how to maintain necessary data and carry out documentation<br>• Explain about Spray Monitoring form and its components | the non-target while pesticide application<br>• Demonstrate the safety practices while spraying agrochemicals such as avoid windward direction, no human or animal movement within or in the close proximity of the farm during and immediately after the spray operations.<br>• Demonstrate the use of GPS and GIS-based sensors, along with drones and satellite imagery to get a 3- Dimensional (3D) analysis of the field and the composition of soil in the cultivated region<br>• Demonstrate drone operation with appropriate sensors to capture high resolution pictures which can be directly sent to the cloud/ software facilitating precise corrective measures in the form of prescription maps<br>• Demonstrate the use of recommended Dose of Fertilizer (RDF) Protocol to assess the soil nutrient status and post-process the data to generate the GPS tagged precision nutrient requirements map of the field as an input logic to the nutrient spraying drone with the help of soil indices<br>• Demonstrate the use of electrostatic nozzle to avoid drift during the operation<br>• Demonstrate the preparation of the relevant reports in graphical or tabular form as per client requirement<br>• Demonstrate labelling of all the materials appropriately<br>• Demonstrate the SOP to store crop nutrients, herbicides, pesticides are separately stored in a secured building with absorbent spill kits in all liquid storage areas and regularly inspect<br>• Demonstrate the use of emergency eyewash and emergency drench showers within or near the storage area, and dispose the excess or obsolete materials or chemicals in accordance with rules and regulations of manufacturer and state law<br>• examine the drone, their peripherals and relevant attachments post completion of operation for signs of wear and tear or damage |

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|---|---|
| • Read labels carefully to understand safety guidance<br>• Explain provisions of Insecticides Rule 1971 | • Demonstrate the maintenance of the drone as per the respective manufacturer's instructions using appropriate and recommended tools and equipment<br>• schedule periodic maintenance of drone, their peripherals and relevant attachments as per the maintenance schedule suggested by their respective manufacturers<br>• Show how to fill the spray monitoring form |
| **Classroom Aids** | |
| Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop | |
| **Tools, Equipment and Other Requirements** | |
| Small/Medium VLOS Agriculture Drone | |

## Module 4: Safety and emergency procedures before and after pesticide spraying through drone operation

*Mapped to NOS AGR/N1020 v2.0*

**Terminal Outcomes:**

- Describe pre and post-application precautionary measures.
- Describe precautionary measures during application
- Demonstrate administration of first aid

| Duration: 30:00 | Duration: 30:00 |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • Explain the importance of restricting drone operation in the drone-forbidden area (airport or electronic station)<br>• Explain the local aviation laws and regulations in area of operation<br>• Explain about working and leak proof condition of the drone spraying system<br>• Explain health and safety guidelines<br>• Explain do and don't while solution preparation and carrying out spraying operation<br>• Explain how to fix flying route to minimize turn around and select flying height as per target crop<br>• State appropriate weather conditions and timing for agro-chemical spray<br>• Explain how to<br>• Explain the risk in entering contaminated area affected by drifting spray<br>• Explain the importance of product label requirements and effective measures to avoid any associated risks<br>• Explain the use of anti-drift nozzle to decrease/avoid drift to human, environment, non-target organisms, crops etc.<br>• Explain about evacuation timing and transfer to fresh air post completion of the pesticide spray operation<br>• Explain about the insecticide rule | • Examine the drone for any damages or leakages<br>• Select the place for take-off and landing, tank mix operations etc.<br>• Identify and mark the obstacles (wall, trees) around the field for safe operation<br>• Show how to set up at least buffer zone (as specified by DGCA) between drone treatment and the non- target crop<br>• Identify water sources and do not spray pesticides near water sources (less than 100 m) to avoid polluting water sources<br>• Select nature of plant protection chemicals, especially herbicides<br>• Demonstrate how to perform dilution of agro-chemical as per recommendation<br>• Show how to rinse the empty container to avoid any contamination for next operation<br>• Demonstrate the safe disposal of the hazardous waste/ spills at appropriate place in correct manner as per the legal regulations and law<br>• Show how to store the plant protection products<br>• select a flying route to minimize turn around<br>• Demonstrate spraying with pure water first to test operation for at least 5 min<br>• Demonstrate two step dilutions to fully dissolve the pesticide<br>• Show how to adopt proper pressure |

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| 1971<br>● Explain about various warning signs to be setup in the spray area for people awareness<br>● Explain preventative measure during transport for leakage of remaining plant protection products<br>● Explain about the maintenance prescription given by the manufacturer of drone and their peripherals<br>● Explain the importance of operation team to stay at the downwind end of the field and backlight direction<br>● Explain the risk of burning or burying hazardous waste<br>● Explain about post spraying care such as shower and wearing clean clothes<br>● Describe the basic safety checks to be done before the operation of any equipment<br>● Describe the common first aid procedures to be followed in case of emergencies.<br>● Explain the importance of reporting details of first aid administered, to the reporting officer/ doctor, in accordance with workplace procedures. | for optimized droplet spectrum (>l00pm).<br>● Demonstrate proper storage of unused chemicals during transport<br>● Demonstrate first aid procedures for dealing with accidents, fires and emergencies.<br>● Demonstrate the use of emergency equipment in accordance with manufacturers' specifications and workplace requirements.<br>● Prepare a list of relevant hotline/ emergency numbers. |
| **Classroom Aids:** | |
| Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator's Guide, Participant Handbook. | |
| **Tools, Equipment and Other Requirements** | |
| Small/ Medium VLOS Agri Drone, water, recommended samples of pesticides/ fertilizers, Personal Protective Equipment, First Aid Kit, Equipment used in Medical Emergencies. | |

## Module 5: Employability Skills (30 hours)

***Mapped to NOS DGT/VSQ/N0101, v1.0***

**Duration: 30:00**

**Key Learning Outcomes**

**Introduction to Employability Skills Duration: 1 Hour**

After completing this programme, participants will be able to:

1. Discuss the importance of Employability Skills in meeting the job requirements

**Constitutional values - Citizenship Duration: 1 Hour**

2. Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.
3. Show how to practice different environmentally sustainable practices

**Becoming a Professional in the 21st Century Duration: 1 Hours**

4. Discuss 21st century skills.
5. Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations.

**Basic English Skills Duration: 2 Hours**

6. Use appropriate basic English sentences/phrases while speaking

**Communication Skills Duration: 4 Hour**

7. Demonstrate how to communicate in a well -mannered way with others.
8. Demonstrate working with others in a team

**Diversity & Inclusion Duration: 1 Hour**

9. Show how to conduct oneself appropriately with all genders and PwD
10. Discuss the significance of reporting sexual harassment issues in time

**Financial and Legal Literacy Duration: 4 Hours**

11. Discuss the significance of using financial products and services safely and securely.
12. Explain the importance of managing expenses, income, and savings.
13. Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws

**Essential Digital Skills Duration: 3 Hours**

14. Show how to operate digital devices and use the associated applications and features, safely and securely
15. Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely

**Entrepreneurship Duration: 7 Hours**

16. Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges

**Customer Service Duration: 4 Hours**

17. Differentiate between types of customers

18. Explain the significance of identifying customer needs and addressing them
19. Discuss the significance of maintaining hygiene and dressing appropriately

**Getting ready for apprenticeship & Jobs Duration: 2 Hours**

20. Create a biodata
21. Use various sources to search and apply for jobs
22. Discuss the significance of dressing up neatly and maintaining hygiene for an interview
23. Discuss how to search and register for apprenticeship opportunities

# Annexure

## Trainer Requirements

| Trainer Prerequisites | | | | | | |
|---|---|---|---|---|---|---|
| Minimum Educational Qualification | **Specialization** | **Relevant Industry Experience** | | **Training Experience** | | **Remarks** |
| | | ***Years*** | ***Specialization*** | ***Years*** | ***Specialization*** | |
| Graduate | Any Degree, preferably in Agriculture and related streams | | | | | For DGCA syllabus at RPTO: TTT Instructor from DGCA Approved RPTO as per DGCA norms<br>For non-DGCA syllabus (Agriculture part) at Training Centre (TC): Remote Pilot Certificate is Mandatory from a DGCA Approved RPTO |
| 12th Pass | Remote Pilot Certificate (RPC) | 1 | Agriculture related experience post RPC Certificate by DGCA | | | For DGCA syllabus at RPTO: TTT Instructor from DGCA Approved RPTO as per DGCA norms<br>For non-DGCA syllabus (Agriculture part) at Training Centre (TC): Remote Pilot Certificate is Mandatory from a DGCA Approved RPTO |

| Trainer Certification | |
|---|---|
| **Domain Certification** | **Platform Certification** |
| Certified for Job Role "**Kisan Drone Operator"**, mapped to QP: "AGR/Q1006, v3.0", 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". The mminimum accepted score as per MEPSC guidelines is 80%. |

## Assessor Requirements

| Assessor Prerequisites | | | | | | |
|---|---|---|---|---|---|---|
| Minimum Educational Qualification | **Specialization** | **Relevant Industry Experience** | | **Training/Assessment Experience** | | **Remarks** |
| | | ***Years*** | ***Specialization*** | ***Years*** | ***Specialization*** | |
| Graduate | Any Degree, preferably in Agriculture and related streams | 1 | Agriculture related aspects | | | For DGCA syllabus: TTT Instructor from DGCA Approved RPTO<br>For non-DGCA syllabus (Agriculture part): Remote Pilot Certificate is Mandatory from a DGCA Approved RPTO |

| Assessor Certification | |
|---|---|
| **Domain Certification** | **Platform Certification** |
| Certified for Job Role "**Kisan Drone Operator"**, mapped to QP: "AGR/Q1006, v3.0", Minimum accepted score is 80% | Certified for the Job Role: "Assessor (Vet and Skills)", mapped to the Qualification Pack: "MEP/Q2701, v2.0", with a minimum score of 80%. |

## Assessment Strategy

**Assessment System Overview**

In Agriculture Sector it is of ultimate importance that individuals dealing with crop production or livestock have the requisite knowledge and competencies to undertake the task. Based on the Assessment Criteria, SSC in association with empaneled AAs, define the test structure for the given job roles to cover the required skills and competencies. Assessment strategy consists of the following:

*The Assessment of DGCA syllabus will be undertaken at RPTO by DGCA approved Instructor

1. Multiple Choice Questions: To assess basic knowledge (Objective/Subjective)
2. Viva: To assess awareness on processes (Oral and/or written questioning)
3. Practical: To evaluate skills and identify competencies. (Observation)

Assessments for knowledge and awareness on processes may be conducted through 'real-time' internet-based evaluation or by conducting the same 'offline' through TABs. Skills and competencies are to be assessed by conducting 'practical' on the ground through qualified and ToA certified assessors.

An individual must have adequate knowledge and skills to perform a specific task, weightage for different aspects of the assessment is given as follows:

- Multiple Choice Questions: 20%-30%, depending on the specific QP
- Viva: 20%
- Practical: 50% - 60% (Involves demonstrations of applications and presentations of procedures/tasks and other components)
- Assessment will be carried out by certified assessors through empaneled assessment partners. Based on the results of the assessment; ASCI will certify the learners/candidates

**The assessment at the Training Centre would not cover the assessment of Core flying NOS_AGR/N1039: Undertake Drone Flying ensuring adherence to laws/procedures, which is being imparted and Assessed at the RPTO as per DGCA rules/ regulations but would only cover the other balance NOSs.**

**Testing Environment**

Assessments are conducted on laptops, Mobiles and android tablets via both offline and online mode depending on the internet connectivity at the assessment location.

In remote locations/villages, assessments get delivered through tablets without the requirement of the Internet.

- Multilingual assessments (ASCI is conducting the assessments in 13 + languages pan India)
- Rubric driven assessments in Practical/Viva sections and responses recorded

accordingly

- All responses, data, records and feedback are stored digitally on the cloud
- Advanced auto-proctoring features – photographs, time-stamp, geographic-tagging, toggle- screen/copy-paste disabled, etc.
- Android-based monitoring system
- End to end process from allocation of a batch to final result upload, there is no manual intervention
- Assessment will normally be fixed for a day after the end date of the training / within 7 days of completion of training.
- Assessment will be conducted at the training venue
- The room where assessment is conducted will be set with proper seating arrangements with enough space to curb copying or other unethical activities
- Question bank of theory and practice will be prepared by ASCI /assessment agency and approved ASCI. Only from approved Question Bank assessment agency will prepare the question paper. Theory testing will include multiple-choice questions, pictorial questions, etc. which will test the trainee on his theoretical knowledge of the subject.
- The theory, practical and viva assessments will be carried out on the same day. In case of a greater number of candidates, the number of assessors and venue facilitation be increased and facilitated

| **Assessment** | | | |
|---|---|---|---|
| **Assessment** | **Formative or Summative** | **Strategies** | **Examples** |
| Theory | Summative | MCQ/Written exam | Knowledge of facts related to the job role and functions. Understanding of principles and concepts related to the job role and functions |
| Practical | Summative | Structured tasks/Demonstration | Practical application /Demonstration /Application tasks |
| Viva | Summative | Questioning and Probing | Mock interviews on the usability of job roles/advantages /importance of adherence to procedures. Viva will be used to gauge trainee's confidence and correct knowledge in handling the job situation |

The question paper is pre-loaded in the computer /Tablet and it will be in the language as requested by the training partner.

# Assessment Quality Assurance framework

## Assessment Framework and Design:

Based on the Assessment Criteria, SSC in association with AAs will define the test structure for the given roles to cover the required skills and competencies. ASCI offer a bouquet of tools for multi-dimensional evaluation of candidates covering language, cognitive skills, behavioral traits and domain knowledge.

**Theoretical Knowledge** - Item constructs and types are determined by a theoretical understanding of the testing objectives and published research about the item types and constructs that have shown statistical validity towards measuring the construct. Test item types that have been reported to be coachable are not included. Based on these, items are developed by domain experts. They are provided with comprehensive guidelines of the testing objectives of each question and other quality measures.

**Type** – Questions based on Knowledge Required, Case-based practical scenario questions and automated simulation-based questions.

**Practical Skills** - The practical assessments are developed taking into consideration two aspects: what practical tasks is the candidate expected to perform on the job and what aspects of the job cannot be judged through theoretical assessments. The candidates shall be asked to perform either an entire task or a set of subtasks depending on the nature of the job role

**Type –** Standardized rubrics for evaluation against a set of tasks in a demo/practical task

**Viva Voce** - Those practical tasks which cannot be performed due to time or resource constraints are evaluated through the viva mode. Practical tasks are backed up with Viva for thorough assessment and complete evaluation

**Type** – Procedural questions, dos and don'ts, subjective questions to check the understanding of practical tasks.

The assessor has to go through an orientation program organized by the Assessment Agency. The training would give an overview to the assessors on the overall framework of QP evaluation. The assessor shall be given a NOS and PC level overview of each QP as applicable. The overall structure of assessment and objectivity of the marking scheme will be explained to them. The giving of marks will be driven by an objective framework that will maintain the standardization of the marking scheme.

## Type of Evidence and Evidence Gathering Protocol:

During the assessment the evidence collected by AAs and ASCI are:

- GeoTagging to track ongoing assessment
- AA's coordinator emails the list of documents and evidence (photos and videos) to the assessor one day before the assessment. The list is mentioned below:
    - Signed Attendance sheet
    - Assessor feedback sheet

- Candidate feedback sheet
- Assessment checklist for assessor
- Candidate Aadhar/ID card verification
- Pictures of the classroom, labs to check the availability of adequate equipment's and tools to conduct the training and assessment
- Pictures and videos of Assessment, training feedback and infrastructure.

- Apart from the Assessor, a Technical assistant is popularly known as Proctor also ensures the proper documentation and they verify each other's tasks.
- To validate their work on the day of the assessment, regular calls and video calls are done.
- On-boarding and training of the assessor and proctor are done on a timely basis to ensure that the quality of the assessment should be maintained.
- Training covers the understanding of QP, NSQF level, NOS and assessment structure

***Methods of Validation***

- Morning Check (Pre-Assessment): Backend team of AA calls and confirms assessor/technical SPOC event status. Assessor/Technical SPOC are instructed to reach the centre on time by 9:30 AM / as decided with TC and delay should be highlighted to the Training Partner in advance.
- Video Calls: Random video calls are made to the technical SPOC/assessor so as to keep a check on assessment quality and ensure assessment is carried out in a fair and transparent manner
- Aadhar verification of candidates
- Evening Check (Post Assessment): Calls are made to the ground team to ensure the event is over by what time and the documentation is done properly or not.
- TP Calling: To keep a check on malpractices, an independent audit team calls the TP on a recorded line to take confirmation if there was any malpractice activity observed in the assessment on part of the AA/SSC team. If calls are not connected, an email is sent to TP SPOC for taking their confirmation
- Video and Picture Evidence: Backend team collects video and pictures for assessment on a real-time basis and highlights any issue such as students sitting idle/ trainer helping the candidates during the assessment.
- Surprise Visit: Time to time SSC/AA Audit team can visit the assessment location and conduct a surprise audit for the assessment carried out by the ground team.
- Geo Tagging: On the day of the assessment, each technical SPOC is required to login into our internal app which is Geotagged. Any deviation with the centre address needs to be highlighted to the assessment team on a real-time basis.

***Method for assessment documentation, archiving, and Access:***

- ASCI have a fully automated result generation process in association with multiple AAs
- Theory, Practical and Viva marks form the basis of the results and encrypted files generated to avoid data manipulation. All responses were captured and stored in the

System with Time-Stamps at the end of AAs and SSC. NOS-wise and PC-wise scores can be generated.

- Maker Checker concept: One person prepares the results and another audit result which is internally approved by AA at first and then gets vetted at the end of SSC
- All softcopies of documents are received from the on-ground tech team over email. The same is downloaded by our internal backend team and saved in Repository. The repository consists of scheme-wise folders. These scheme-wise folders have two job role-specific folders. These specific folders have Year wise and Month wise folders where all documents are saved in Batch specific folders. All Hard copies are filed and stored in the storeroom.

***Result Review & Recheck Mechanism –***

- Time-stamped assessment logs
- Answer/Endorsement sheets for each candidate
- Attendance Sheet
- Feedback Forms: Assessor feedback form, Candidate feedback form, TP feedback form
- The results for each of the candidates shall be stored and available for review (retained for 5 years/ till the conclusion of the project or scheme)

# 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** | The 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** | The 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 |
|---|---|
| AGR | Agriculture |
| UA | Unmanned Aircraft |
| RPA | Remotely Piloted Aircraft |
| UAVS | Unmanned Aircraft Vehicle System |
| FRTOL | Flight Radio Telephony Operator License |
| NOS | National Occupational Standard (s) |
| NSQF | National Skills Qualifications Framework |
| OJT | On-the-job Training |
| QP | Qualifications Pack |
| DGCA | Directorate General of Civil Aviation |
| RPTO | Remote Pilot Training organization |
| PwD | People with Disability |
| PPE | Personal Protective Equipment |
| ATC | Air Traffic Control |
| METAR | Met Terminal Aviation Routine Weather Report |