Qualification Pack

Precision Farming Technician

QP Code: AGR/Q1007

Version: 1.0

NSQF Level: 5

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AGR/Q1007: Precision Farming Technician

Brief Job Description

A Precision Farming Technician is responsible for using the relevant technologies in agricultural activities to enhance productivity and profitability while ensuring sustainability and protection of the land resources. The individual uses relevant technologies and equipment such as Geographic Information System (GIS), Global Positioning System (GPS), drones, a variety of sensors, and relevant computer software to collect and analyze different types of data from agricultural fields. The person identifies and makes appropriate improvements in the field based on data analysis. The individual is also responsible for regular maintenance of mechanical controls, sensors, GPS and GIS systems, etc.

Personal Attributes

The individual must be physically fit to work for long durations with the ability to make appropriate decisions independently. The person must have strong verbal and written communication skills to interact with various stakeholders. Analytical and problem-solving skills are the other essential requirements in this job role.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. AGR/N1033: Collect data from the field using precision farming technologies
2. AGR/N1034: Analyse and utilise the data collected from the field
3. AGR/N1035: Carry out maintenance of sensors and relevant equipment
4. AGR/N1036: Use the relevant mobile apps and e-payment methods
5. AGR/N9903: Maintain health and safety at the workplace
6. DGT/VSQ/N0103: Employability Skills (90 Hours)

Qualification Pack (QP) Parameters

Sector	Agriculture
Sub-Sector	Agriculture Crop Production
Occupation	Precision Farming
Country	India

Qualification Pack

NSQF Level	5
Credits	16
Aligned to NCO/ISCO/ISIC Code	NCO-2015/NIL
Minimum Educational Qualification & Experience	Completed 2nd year of UG (UG Diploma) (in Agriculture/ Horticulture/ Forestry/ Agriculture Engineering/ Agri-Business Management) OR Pursuing 2nd year of UG (in Agriculture/ Horticulture/ Forestry/ Agriculture Engineering/ Agri-Business Management and continuous education) OR Completed 2nd year diploma after 12th (in Agriculture/ Horticulture/ Forestry/ Agriculture Engineering) OR Pursuing 2nd year of 2-year diploma after 12th (in Agriculture/ Horticulture/ Forestry/ Agriculture Engineering) OR 12th pass with 1 year Vocational Education & training (NTC or NAC or CITS) OR Completed 3-year diploma (after 10th) (in Agriculture/ Horticulture/ Forestry/ Agriculture Engineering) with 1 Year of experience in the relevant field OR 12th grade Pass with 2 Years of experience in the relevant field OR 10th grade pass with 4 Years of experience in the relevant field OR Previous relevant Qualification of NSQF Level (Level-4 and with minimum education as 8th Grade pass) with 3 Years of experience in the relevant field OR Previous relevant Qualification of NSQF Level (Level - 4.5 with 1.5 years of relevant experience)
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years

Qualification Pack

Last Reviewed On	NA
Next Review Date	05/01/2026
NSQC Approval Date	05/01/2023
Version	1.0
Reference code on NQR	QG-05-AG-00093-2023-V1-ASCI
NQR Version	1.0

AGR/N1033: Collect data from the field using precision farming technologies

Description

This OS unit is about collecting different types of data from the agricultural field to determine the appropriate enhancements under precision farming.

Scope

The scope covers the following :

- Arrange the required field devices
- Install and prepare the field devices
- Collect the soil data
- Collect data through geo-referencing, GPS, satellites and drones
- Collect the field sensor-based data

Elements and Performance Criteria

Arrange the required field devices

To be competent, the user/individual on the job must be able to:

PC1. arrange the relevant field devices, such as smart sensors, field data recorders, GPS receivers, etc., to be used for recording the relevant data from agricultural fields

PC2. check the field devices to ensure their correct functioning and coordinate with the manufacturer to get them repaired or replaced as appropriate

Install and prepare the field devices

To be competent, the user/individual on the job must be able to:

PC3. identify the appropriate locations in the field for the installation of field data recorders and remote sensors

PC4. install and calibrate a variety of sensors, e.g. soil moisture sensors, appropriately at the identified locations in the field, as per the manufacturers' instructions

PC5. attach the smart sensors and GPS receivers to farm machineries such as tractors, fertilizer/ pesticide sprayers, and combine harvesters, following the manufacturers' instructions

PC6. set up the GPS-based vehicle guidance system along with the relevant mechanical controls

PC7. set up the relevant mobile application and/or computer software for the collection and analysis of data

PC8. set the drone appropriately to ensure it takes the captures the required images using the attached camera

PC9. use the appropriate flight planning software to plan a route in the area that needs to be covered, allowing the drones to follow the automated flight path created by the software

Collect the soil data

To be competent, the user/individual on the job must be able to:

PC10. identify sampling sites and develop soil sampling grids using geospatial technology for testing nitrogen, phosphorus, potassium content, pH, and micronutrients in the soil

PC11. collect information about soil or field attributes, yield data, or field boundaries using field data recorders and basic Geographic Information Systems (GIS)

PC12. collect the appropriate information regarding the soil, topography, terrain, moisture levels, organic matter, nitrogen and pH using the geo-mapping technology

PC13. use soil Electrical Conductivity (EC) sensors or Electro-Magnetic (EM) sensors to map soil properties, such as soil organic matter, clay, soluble salts, etc.

PC14. monitor the moisture levels of the soil and its moisture-holding capacity at different sites in the field using the appropriate dielectric soil moisture sensors, such as water-potential sensor and tensiometer sensor

PC15. monitor the levels of phosphorous, potassium, calcium, sodium, nitrogen, copper, iron, alkaline and acids in the soil with the help of electrochemical sensors

PC16. carry out zone soil sampling to determine the patterns of residual crop nutrients in the soil

Collect data through geo-referencing, GPS, satellites and drones

To be competent, the user/individual on the job must be able to:

PC17. record site-specific information through GPS via an interface with the satellites

PC18. collect geo-referenced data with the help of GPS receivers mounted on the farm machineries

PC19. use geo-mapping, sensors, integrated electronic communications and variable rate technology to record the crop scouting data

PC20. use 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

PC21. coordinate with an appropriate service provider to obtain high-resolution satellite imagery and information regarding moisture stress, disease, structural anomalies, nutrient levels, and the yield health

PC22. use drones to monitor the effects of weather; crop growth and yield; weed and pest/ insect infestation; trespassing into the field by animals, preying by birds, and record the data

Collect the field sensor-based data

To be competent, the user/individual on the job must be able to:

PC23. use the appropriate types of sensors with drones to monitor the distribution of irrigation water in different parts of the field and inspect the irrigation equipment

PC24. measure and record the differences at specific locations within the field as per site-specific management

PC25. determine the spatial and temporal variability in agricultural systems, including their effects on production and relationships among the applicable factors

PC26. use yield monitors to collect yield data and develop a map for identifying the areas of productivity in the field

PC27. use optical sensors to determine the properties of soil and crop through the analysis of the amount of reflected light on the growing parts of the crop

PC28. determine the amount of force exerted by roots in the field to absorb water with the help of mechanical sensors

PC29. use field sensors integrated with image recognition technology to monitor the crops from remote locations

PC30. carry out agriculture field mapping and transfer data from the field to the appropriate software via integrated electronic communications

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the benefit of precision farming in eliminating volatility and relevant risks in agricultural operations

KU2. different components of precision farming, such as GPS based sensors, Geographical Information System (GIS)-based sensors, electrochemical sensors, mechanical sensors, soil moisture sensors, airflow sensors, yield monitoring sensors, Variable Rate Application (VRA) sensors, Differential Geo-positioning System (DGPS), etc.

KU3. the process of attaching smart sensors and GPS receivers to farm machineries such as tractors, fertilizer/ pesticide sprayers, combine harvesters, etc.

KU4. the process of identifying the appropriate locations in the field for the installation of field data recorders and remote sensors

KU5. the process of installing and calibrating a variety of sensors at the identified locations in the field

KU6. how to set up the GPS-based vehicle guidance system along with the relevant mechanical controls

KU7. the process of setting up the relevant mobile application and computer software for data collection and analysis

KU8. how to set the drone appropriately to ensure it takes the required camera shots using the attached camera

KU9. how to use flight planning software to plan a route for drones

KU10. how to position various farm machineries in the field using the GPS

KU11. the process of recording site-specific information through GPS via an interface with the satellites

KU12. the process of identifying sampling sites and developing soil sampling grids using geospatial technology for soil testing on characteristics such as nitrogen, phosphorus, and potassium content, pH, and micronutrients

KU13. the use of field data recorders and GIS for collecting information about soil or field attributes, yield data, or field boundaries

KU14. the process of recording geo-referenced data with the use of GPS receivers mounted on the farm machineries

KU15. how to determine the spatial and temporal variability in agricultural systems, their effects on production, and relationships among the applicable factors

KU16. the importance of using statistically valid sampling designs for collecting samples from the field

KU17. the benefit and process of using the geo-mapping technology for collecting relevant information from the field regarding the soil, topography, terrain, moisture levels, organic matter, nitrogen and pH

KU18. the process of using the geo-mapping technology, sensors, integrated electronic communications and variable rate technology to record the relevant data from the field, such as the crop scouting data

KU19. the appropriate site-specific management practices to be followed to detect, measure and record the differences within the field

KU20. the process of determining the crop nutrient requirements through sampling

KU21. the use of yield monitors for collecting yield data and developing a map for identifying the areas of productivity in the field

KU22. how to use soil Electrical Conductivity (EC) sensors or Electro-Magnetic (EM) sensors to map various soil properties, such as soil organic matter, clay, soluble salts, etc.

KU23. the process of carrying out zone soil sampling to determine the patterns of residual crop nutrients in the soil

KU24. the benefit of using on-the-go soil pH sensors for determining the alkalinity and acidity levels in the soil

KU25. the benefit and process of using GPS and GIS-based sensors, drones and satellite imagery to get a 3D analysis of the field and the composition of soil in the cultivated region

KU26. various uses of drones, such as monitoring the effects of weather, the distribution of irrigation water, crop growth and yield, weed and pest/ insect infestation, etc.

KU27. the benefits and process of using optical sensors to determine the properties of soil and crop through

KU28. the process of using electrochemical sensors to monitor the levels of phosphorous, potassium, calcium, sodium, nitrogen, copper, iron, alkaline and acids in the soil

KU29. the process of using mechanical sensors to determine the amount of force exerted by roots in the field to absorb water

KU30. the use of dielectric different soil moisture sensors, such as water-potential sensor and tensiometer sensor for monitoring the moisture levels of the soil and its moisture-holding capacity

KU31. the process of using sensors and remote sensing technology for creating maps and transferring data from the field to the appropriate software via integrated electronic communications

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records

GS2. read the relevant literature to get information about the latest developments in the field of work

GS3. listen attentively to understand the information/ instructions being shared by the speaker

GS4. communicate clearly and politely with co-workers and clients

GS5. co-ordinate with co-workers to achieve work objectives

GS6. plan and prioritise tasks to ensure timely completion

GS7. identify possible disruptions to work and take appropriate preventive measures

GS8. take quick decisions to deal with workplace emergencies/ accidents

GS9. evaluate all possible solutions to a problem to select the best one

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Arrange the required field devices	**2**	**3**	**-**	**2**
PC1. arrange the relevant field devices, such as smart sensors, field data recorders, GPS receivers, etc., to be used for recording the relevant data from agricultural fields	-	-	-	-
PC2. check the field devices to ensure their correct functioning and coordinate with the manufacturer to get them repaired or replaced as appropriate	-	-	-	-
Install and prepare the field devices	**7**	**9**	**-**	**7**
PC3. identify the appropriate locations in the field for the installation of field data recorders and remote sensors	-	-	-	-
PC4. install and calibrate a variety of sensors, e.g. soil moisture sensors, appropriately at the identified locations in the field, as per the manufacturers' instructions	-	-	-	-
PC5. attach the smart sensors and GPS receivers to farm machineries such as tractors, fertilizer/ pesticide sprayers, and combine harvesters, following the manufacturers' instructions	-	-	-	-
PC6. set up the GPS-based vehicle guidance system along with the relevant mechanical controls	-	-	-	-
PC7. set up the relevant mobile application and/or computer software for the collection and analysis of data	-	-	-	-
PC8. set the drone appropriately to ensure it takes the captures the required images using the attached camera	-	-	-	-
PC9. use the appropriate flight planning software to plan a route in the area that needs to be covered, allowing the drones to follow the automated flight path created by the software	-	-	-	-
Collect the soil data	**7**	**9**	**-**	**7**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. identify sampling sites and develop soil sampling grids using geospatial technology for testing nitrogen, phosphorus, potassium content, pH, and micronutrients in the soil	-	-	-	-
PC11. collect information about soil or field attributes, yield data, or field boundaries using field data recorders and basic Geographic Information Systems (GIS)	-	-	-	-
PC12. collect the appropriate information regarding the soil, topography, terrain, moisture levels, organic matter, nitrogen and pH using the geo-mapping technology	-	-	-	-
PC13. use soil Electrical Conductivity (EC) sensors or Electro-Magnetic (EM) sensors to map soil properties, such as soil organic matter, clay, soluble salts, etc.	-	-	-	-
PC14. monitor the moisture levels of the soil and its moisture-holding capacity at different sites in the field using the appropriate dielectric soil moisture sensors, such as water-potential sensor and tensiometer sensor	-	-	-	-
PC15. monitor the levels of phosphorous, potassium, calcium, sodium, nitrogen, copper, iron, alkaline and acids in the soil with the help of electrochemical sensors	-	-	-	-
PC16. carry out zone soil sampling to determine the patterns of residual crop nutrients in the soil	-	-	-	-
Collect data through geo-referencing, GPS, satellites and drones	**6**	**8**	**-**	**6**
PC17. record site-specific information through GPS via an interface with the satellites	-	-	-	-
PC18. collect geo-referenced data with the help of GPS receivers mounted on the farm machineries	-	-	-	-
PC19. use geo-mapping, sensors, integrated electronic communications and variable rate technology to record the crop scouting data	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. use 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	-	-	-	-
PC21. coordinate with an appropriate service provider to obtain high-resolution satellite imagery and information regarding moisture stress, disease, structural anomalies, nutrient levels, and the yield health	-	-	-	-
PC22. use drones to monitor the effects of weather; crop growth and yield; weed and pest/ insect infestation; trespassing into the field by animals, preying by birds, and record the data	-	-	-	-
Collect the field sensor-based data	**8**	**11**	**-**	**8**
PC23. use the appropriate types of sensors with drones to monitor the distribution of irrigation water in different parts of the field and inspect the irrigation equipment	-	-	-	-
PC24. measure and record the differences at specific locations within the field as per site-specific management	-	-	-	-
PC25. determine the spatial and temporal variability in agricultural systems, including their effects on production and relationships among the applicable factors	-	-	-	-
PC26. use yield monitors to collect yield data and develop a map for identifying the areas of productivity in the field	-	-	-	-
PC27. use optical sensors to determine the properties of soil and crop through the analysis of the amount of reflected light on the growing parts of the crop	-	-	-	-
PC28. determine the amount of force exerted by roots in the field to absorb water with the help of mechanical sensors	-	-	-	-
PC29. use field sensors integrated with image recognition technology to monitor the crops from remote locations	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC30. carry out agriculture field mapping and transfer data from the field to the appropriate software via integrated electronic communications	-	-	-	-
NOS Total	**30**	**40**	**-**	**30**

National Occupational Standards (NOS) Parameters

NOS Code	AGR/N1033
NOS Name	Collect data from the field using precision farming technologies
Sector	Agriculture
Sub-Sector	Agriculture Crop Production
Occupation	Precision Farming
NSQF Level	5
Credits	2
Version	1.0
Last Reviewed Date	NA
Next Review Date	05/01/2026
NSQC Clearance Date	05/01/2023

AGR/N1034: Analyse and utilise the data collected from the field

Description

This OS unit is about analysing various types of data collected from the field and using it to make appropriate improvements in agricultural practices. It also covers resource optimisation, waste management, and practising inclusion.

Scope

The scope covers the following :

- Prepare the data for analysis
- Analyse the collected data
- Prepare reports and compare data
- Optimise the use of agricultural inputs
- Improve agricultural operations and production

Elements and Performance Criteria

Prepare the data for analysis

To be competent, the user/individual on the job must be able to:

PC1. consolidate the field data in the appropriate format

PC2. carry out appropriate corrections in the collected data, as required, such as the removal of outliers and correction of GPS inaccuracies

PC3. develop and analyse computer-based images to research soils, fertilizers, pests, weather, and other agricultural elements

Analyse the collected data

To be competent, the user/individual on the job must be able to:

PC4. evaluate materials that affect soil characteristics and drainage patterns

PC5. determine the compaction of the soil and optimum pressure required to pump air to aerate the soil to make it fertile

PC6. analyse remote sensing imagery to identify relationships between soil quality, crop canopy densities, light reflectance, and weather history

PC7. use the advanced data analytics services to assess the impact of adverse weather conditions on the field to plan agricultural production accordingly

PC8. identify areas in the field requiring pesticide treatment by analysing geospatial data regarding insect movement and damage patterns

PC9. analyse the crop scouting data to be used for regulating the use of different types of pesticides in the field

PC10. identify geo-referenced zones in the agricultural field based on soil characteristics and production potential

PC11. determine patterns in the soil and weather conditions, seed viability, topography, nutrients, disease history, row distance and planting depth

PC12. calculate the variable planting rates using the variable rate technology, accommodating varying conditions in the field for the maximum yield

PC13. compare crop yield maps with maps of soil test data, chemical application patterns, or other information to develop site-specific crop management plans

PC14. identify best crop varieties and seeding rates for specific field areas based on the analysis of geospatial data

Prepare reports and compare data

To be competent, the user/individual on the job must be able to:

PC15. prepare the relevant reports in graphical or tabular form, summarising field productivity and profitability

PC16. carry out a comparison of the current and historical field data to identify patterns and areas of concern/improvement

Optimise the use of agricultural inputs

To be competent, the user/individual on the job must be able to:

PC17. use the crop scouting data in programmable farm equipment, such as variable-rate planting equipment or pesticide sprayers, based on inputs from crop scouting analysis data regarding the variability of conditions in the field

PC18. use the automated spot spraying systems and boomspray technology to limit the over-application of chemicals and reduce the migration of chemicals to areas other than the field

PC19. manage the irrigation schedule and distribution of irrigation water based on the precise measurement of health, heat, and crop density data obtained with the use of drones

PC20. maintain appropriate moisture levels in the soil to prevent damp conditions based on the data captured by dielectric soil moisture sensors

PC21. follow the recommended practices to avoid waterlogging, mitigate unnecessary damage to sensitive crops, and achieve efficient drainage based on the aerial imagery captured by drones

PC22. increase the use of fertilizers for weak crop plants and regulate its dosage for the healthy crop plants based on the analysis of data obtained from optical sensors

PC23. regulate the levels of calcium, sodium, copper, iron, alkaline and acids in the soil based on the data captured by electrochemical sensors

PC24. use the data recorded by mechanical sensors to optimise the tilling methodologies and the inflow of water in the field

Improve agricultural operations and production

To be competent, the user/individual on the job must be able to:

PC25. follow the appropriate practices to reduce environmental risks and the footprint of farming on the environment, e.g. limiting the leaching of nitrogen

PC26. install and use the automatic irrigation control system to regulate the use of water and achieve water-use efficiency

PC27. use solar energy-operated precision sprayer to apply pesticides in the field

PC28. identify weeds efficiently using the advanced weed identification system and remove them using agricultural robots

PC29. use GPS, high precision positioning system, and automated steering system for automated positioning and navigation of farm machineries

PC30. follow the appropriate practices to enhance the quality of farm produce, such as intercropping, adopting optimum plating density, growing pest/insect/ disease-resistant crop varieties

PC31. follow the recommended practices to improve the economics of agricultural operations, such as the use of agricultural inputs based on the field data collected with the help of field devices

PC32. apply fertilizers, herbicides, pesticides and insecticides at the identified sites in the field, using drones, monitoring for their appropriate application

PC33. utilise soft-touch robotics along with Light Detection and Ranging (LiDAR) technology to identify and pick the ripe crop

PC34. use IoT enabled farm machinery in integration with machine learning (ML) to allow farm machinery to learn smart ways for sustainable agriculture

PC35. use the latest internet-based system/ technologies for enhanced traceability of produce in the supply chain

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the benefit of using the IoT, drones, GPS and other technologies to collect data from agricultural fields to improve decision-making

KU2. the concept of geo-informatics, its tools and techniques and their application in precision farming

KU3. the use of GIS software

KU4. the integration of geo-informatics, Nano-technology and precision farming

KU5. how to generate spectral profiles of different objects

KU6. how to create and edit spatial data.

KU7. the use of relevant image processing software

KU8. the benefits and use of automatic irrigation control system

KU9. the benefits and use of solar energy-operated precision pesticide spraying equipment

KU10. the visual and digital interpretation of remote sensing images

KU11. how to generate spectral profiles of different objects

KU12. modern field preparation method and techniques and planting methods

KU13. the application of precision farming in horticultural crops

KU14. the mechanized harvesting of produce

KU15. how to match farming practices closely to crop needs, e.g. fertilizer application

KU16. the multi-spectral remote sensing for soil mapping

KU17. how to create thematic layers of soil fertility based on GIS

KU18. how to create productivity and management zones

KU19. how to determine fertilizer requirements based on VRT and STCR techniques

KU20. the benefit of using geospatial technology to monitor crop stress (biotic/abiotic)

KU21. the use of GPS for agricultural surveys

KU22. the formulation, characterization and applications of nanoparticles in agriculture

KU23. the process of project formulation and execution related to precision farming.

KU24. the importance and benefits of selecting advanced cultivation practices and good-performing crops based on the suitability of land

KU25. the use of geospatial technology, such as GPS, geographic information systems GIS

KU26. the benefits of variable rate chemical input applicators

KU27. use of the relevant computer mapping software

KU28. the use of different types of sensors and devices, such as yield monitors, soil electrical conductivity or electro-magnetic sensors, remote imagery, satellite imagery, aerial photography, hand-held active sensors, soil compaction sensors, etc.

KU29. the use of relevant technologies for crop monitoring, irrigation management, nutrient application, disease and pest management, and yield prediction

KU30. the importance and process of carrying out appropriate corrections in the collected data, such as the removal of outliers and correction of GPS inaccuracies

KU31. how to identify spatial coordinates by analysing the remote sensing GPS data

KU32. the process of analysing geospatial data to determine the impact of factors such as soil quality, terrain, field productivity, fertilizers, and weather conditions on agricultural production

KU33. how to process the analysed data from harvester monitors to develop yield maps

KU34. the process of developing the relevant 3D maps, such as soil characteristics, contour, plat, input application, terrain, and drainage patterns, using the appropriate computer software

KU35. the importance and process of evaluating the materials that affect soil characteristics and drainage patterns

KU36. how to use GIS for spatial analysis and visualisation of interpolated maps

KU37. how to analyse remote sensing imagery to identify relationships between soil quality, crop canopy densities, light reflectance, and weather history

KU38. how to develop and analyse computer-based images to research soils, fertilizers, pests, weather, and other agricultural elements

KU39. how to use the advanced data analytics services to assess the impact of adverse weather conditions on the field and plan agricultural production accordingly

KU40. the process of analysing the crop scouting data to be used for regulating the use of pesticides, insecticides and herbicides in the field

KU41. how to identify geo-referenced zones in the agricultural field based on soil characteristics and production potential

KU42. the process of determining patterns in the soil and weather conditions, seed viability, topography, nutrients, disease history, row distance and planting depth

KU43. how to calculate the variable planting rates using the Variable Rate Technology (VRT)

KU44. the importance and process of comparing the crop yield maps with maps of soil test data, chemical application patterns, or other information to develop site-specific crop management plans

KU45. the process of identifying the best crop varieties and seeding rate for specific field areas, based on the analysis of geospatial data

KU46. how to identify areas in the field requiring pesticide treatment by analysing geospatial data regarding insect movement and damage patterns

KU47. how to determine the compaction of the soil and optimum pressure required to pump air to aerate the soil to make it fertile

KU48. the process of preparing the relevant reports in graphical or tabular form, summarising field productivity and profitability

KU49. how to use the sampling data from the relevant software records for improving decision making, traceability, quality of the produce, and market opportunities

KU50. the importance of using the information regarding the differences at specific locations in the field to regulate the quantity of various inputs

KU51. the process of using the crop scouting data in programmable agricultural equipment

KU52. the importance of adjusting the irrigation schedule and distribution of irrigation water based on the data obtained with the use of drones

KU53. the recommended practices to be followed for avoiding waterlogging, mitigating unnecessary damage to sensitive crops, and achieving effective drainage

KU54. the importance and process of regulating the use of fertilizers based on the analysis of data obtained from optical sensors

KU55. the importance and process of regulating the moisture levels in the soil to prevent damp conditions

KU56. the importance and process of regulating the levels of phosphorous, potassium, calcium, sodium, nitrogen, copper, iron, alkaline and acids in the soil

KU57. how to optimise the tilling methodologies and the inflow of water in the field based on the data recorded by mechanical sensors

KU58. how to reduce the negative impacts of farming practices on the environment

KU59. the use of the advanced weed identification system for efficient identification of weeds

KU60. the benefit and process of using automated spot spraying systems and boomspray technology to limit the over-application of chemicals and reduce the migration of chemicals to areas other than the field

KU61. the process of using GPS, high precision positioning system, and automated steering system to minimise the chances of human error experienced in manual driving mode

KU62. how to program farm equipment based on inputs from crop scouting analysis data regarding the variability of conditions in the field

KU63. the importance of managing irrigation in the field based on the analysis of the data provided by dielectric soil moisture sensors

KU64. the process of using drones to apply fertilizers, herbicides, pesticides and insecticides uniformly at the identified sites in the field

KU65. the importance of following environmental and ecological best practices

KU66. the applications of LiDAR accurate remote sensing technique for various purposes in precision farming

KU67. different types of farm expenses and benefits of precision farming to reduce them

KU68. the benefits of using a personalized crop calendar for farm needs

KU69. the benefits of using agronomic solutions services for quicker resolution of farm issues

KU70. the benefits of using e-markets to market agricultural produce

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records
GS2. communicate clearly and politely with co-workers and clients
GS3. read the relevant literature to get information about the latest developments in the field of work
GS4. plan and prioritise tasks to ensure timely completion
GS5. take quick decisions to deal with workplace emergencies/ accidents
GS6. listen attentively to understand the information/ instructions being shared by the speaker
GS7. identify possible disruptions to work and take appropriate preventive measures
GS8. co-ordinate with co-workers to achieve work objectives
GS9. evaluate all possible solutions to a problem to select the best one

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare the data for analysis	**2**	**3**	**-**	**2**
PC1. consolidate the field data in the appropriate format	-	-	-	-
PC2. carry out appropriate corrections in the collected data, as required, such as the removal of outliers and correction of GPS inaccuracies	-	-	-	-
PC3. develop and analyse computer-based images to research soils, fertilizers, pests, weather, and other agricultural elements	-	-	-	-
Analyse the collected data	**9**	**12**	**-**	**9**
PC4. evaluate materials that affect soil characteristics and drainage patterns	-	-	-	-
PC5. determine the compaction of the soil and optimum pressure required to pump air to aerate the soil to make it fertile	-	-	-	-
PC6. analyse remote sensing imagery to identify relationships between soil quality, crop canopy densities, light reflectance, and weather history	-	-	-	-
PC7. use the advanced data analytics services to assess the impact of adverse weather conditions on the field to plan agricultural production accordingly	-	-	-	-
PC8. identify areas in the field requiring pesticide treatment by analysing geospatial data regarding insect movement and damage patterns	-	-	-	-
PC9. analyse the crop scouting data to be used for regulating the use of different types of pesticides in the field	-	-	-	-
PC10. identify geo-referenced zones in the agricultural field based on soil characteristics and production potential	-	-	-	-
PC11. determine patterns in the soil and weather conditions, seed viability, topography, nutrients, disease history, row distance and planting depth	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. calculate the variable planting rates using the variable rate technology, accommodating varying conditions in the field for the maximum yield	-	-	-	-
PC13. compare crop yield maps with maps of soil test data, chemical application patterns, or other information to develop site-specific crop management plans	-	-	-	-
PC14. identify best crop varieties and seeding rates for specific field areas based on the analysis of geospatial data	-	-	-	-
Prepare reports and compare data	**2**	**4**	**-**	**2**
PC15. prepare the relevant reports in graphical or tabular form, summarising field productivity and profitability	-	-	-	-
PC16. carry out a comparison of the current and historical field data to identify patterns and areas of concern/improvement	-	-	-	-
Optimise the use of agricultural inputs	**7**	**9**	**-**	**7**
PC17. use the crop scouting data in programmable farm equipment, such as variable-rate planting equipment or pesticide sprayers, based on inputs from crop scouting analysis data regarding the variability of conditions in the field	-	-	-	-
PC18. use the automated spot spraying systems and boomspray technology to limit the over-application of chemicals and reduce the migration of chemicals to areas other than the field	-	-	-	-
PC19. manage the irrigation schedule and distribution of irrigation water based on the precise measurement of health, heat, and crop density data obtained with the use of drones	-	-	-	-
PC20. maintain appropriate moisture levels in the soil to prevent damp conditions based on the data captured by dielectric soil moisture sensors	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC21. follow the recommended practices to avoid waterlogging, mitigate unnecessary damage to sensitive crops, and achieve efficient drainage based on the aerial imagery captured by drones	-	-	-	-
PC22. increase the use of fertilizers for weak crop plants and regulate its dosage for the healthy crop plants based on the analysis of data obtained from optical sensors	-	-	-	-
PC23. regulate the levels of calcium, sodium, copper, iron, alkaline and acids in the soil based on the data captured by electrochemical sensors	-	-	-	-
PC24. use the data recorded by mechanical sensors to optimise the tilling methodologies and the inflow of water in the field	-	-	-	-
Improve agricultural operations and production	**10**	**12**	**-**	**10**
PC25. follow the appropriate practices to reduce environmental risks and the footprint of farming on the environment, e.g. limiting the leaching of nitrogen	-	-	-	-
PC26. install and use the automatic irrigation control system to regulate the use of water and achieve water-use efficiency	-	-	-	-
PC27. use solar energy-operated precision sprayer to apply pesticides in the field	-	-	-	-
PC28. identify weeds efficiently using the advanced weed identification system and remove them using agricultural robots	-	-	-	-
PC29. use GPS, high precision positioning system, and automated steering system for automated positioning and navigation of farm machineries	-	-	-	-
PC30. follow the appropriate practices to enhance the quality of farm produce, such as intercropping, adopting optimum plating density, growing pest/insect/ disease-resistant crop varieties	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC31. follow the recommended practices to improve the economics of agricultural operations, such as the use of agricultural inputs based on the field data collected with the help of field devices	-	-	-	-
PC32. apply fertilizers, herbicides, pesticides and insecticides at the identified sites in the field, using drones, monitoring for their appropriate application	-	-	-	-
PC33. utilise soft-touch robotics along with Light Detection and Ranging (LiDAR) technology to identify and pick the ripe crop	-	-	-	-
PC34. use IoT enabled farm machinery in integration with machine learning (ML) to allow farm machinery to learn smart ways for sustainable agriculture	-	-	-	-
PC35. use the latest internet-based system/ technologies for enhanced traceability of produce in the supply chain	-	-	-	-
NOS Total	**30**	**40**	**-**	**30**

National Occupational Standards (NOS) Parameters

NOS Code	AGR/N1034
NOS Name	Analyse and utilise the data collected from the field
Sector	Agriculture
Sub-Sector	Agriculture Crop Production
Occupation	Precision Farming
NSQF Level	5
Credits	2
Version	1.0
Last Reviewed Date	NA
Next Review Date	05/01/2026
NSQC Clearance Date	05/01/2023

AGR/N1035: Carry out maintenance of sensors and relevant equipment

Description

This OS unit is about maintaining a variety of sensors and equipment used in precision farming.

Scope

The scope covers the following :

- Maintain the sensors
- Schedule maintenance and maintain the records

Elements and Performance Criteria

Maintain the sensors

To be competent, the user/individual on the job must be able to:

PC1. examine all the sensors used in precision farming for signs of wear and tear or damage

PC2. test the functioning of sensors and relevant equipment as per the testing procedures suggested by their respective manufacturers

PC3. replace the faulty or damaged sensors with the new and authentic ones and calibrate them as per the manufacturer's instructions

PC4. use the appropriate and recommended tools and equipment during the repair and maintenance activities

PC5. follow the manufacturers' instructions to pair the sensors with the relevant mobile application and/or computer software for the collection and analysis of data

PC6. perform the relevant tests to ensure the expected functioning of the sensors and carry out troubleshooting as required

PC7. coordinate with the manufacturer to resolve any manufacturing-related issues experienced with sensors

PC8. collect and analyse test data using the relevant mobile application and/or the computer software to ensure their correct functioning

Schedule maintenance and maintain the records

To be competent, the user/individual on the job must be able to:

PC9. schedule the periodic maintenance of sensors and other equipment as per the maintenance schedule suggested by their respective manufacturers

PC10. maintain the manual and/or electronic records of the maintenance and tests performed, using the physical registers and/or the relevant computer software

PC11. maintain electronic records of overall farm operations and create their backup to protect against accidental loss

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the importance of checking all the sensors and equipment regularly for signs of wear and tear or damage

KU2. the process of testing the functioning of sensors and relevant equipment as per the testing procedures suggested by their manufacturers

KU3. the process of replacing the faulty or damaged sensors and calibrating them as per the manufacturer's instructions

KU4. the importance of using the appropriate and recommended tools and equipment during the repair and maintenance activities

KU5. how to pair the sensors with the relevant mobile application and computer software for the collection and analysis of data

KU6. the importance of performing the relevant tests after replacing sensors to ensure they function as expected

KU7. common manufacturing defects found in a variety of sensors used in precision farming

KU8. the importance of collecting and analysing test data using the relevant mobile application and the computer software to ensure their correct functioning

KU9. the importance of scheduling the periodic maintenance of sensors and other equipment as per the maintenance schedule suggested by their manufacturers

KU10. how to maintain various records manually and electronically using the physical registers and the relevant computer software, respectively

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. communicate politely and professionally

GS2. listen attentively to understand the information/ instructions being shared by the speaker

GS3. maintain work-related notes and records

GS4. read the relevant literature to learn about the latest developments in the field of work

GS5. plan and prioritise tasks to ensure timely completion

GS6. evaluate all possible solutions to a problem to select the best one

GS7. identify possible disruptions to work and take appropriate preventive measures

GS8. take quick decisions to deal with workplace emergencies/ accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Maintain the sensors	**22**	**28**	**-**	**22**
PC1. examine all the sensors used in precision farming for signs of wear and tear or damage	-	-	-	-
PC2. test the functioning of sensors and relevant equipment as per the testing procedures suggested by their respective manufacturers	-	-	-	-
PC3. replace the faulty or damaged sensors with the new and authentic ones and calibrate them as per the manufacturer's instructions	-	-	-	-
PC4. use the appropriate and recommended tools and equipment during the repair and maintenance activities	-	-	-	-
PC5. follow the manufacturers' instructions to pair the sensors with the relevant mobile application and/or computer software for the collection and analysis of data	-	-	-	-
PC6. perform the relevant tests to ensure the expected functioning of the sensors and carry out troubleshooting as required	-	-	-	-
PC7. coordinate with the manufacturer to resolve any manufacturing-related issues experienced with sensors	-	-	-	-
PC8. collect and analyse test data using the relevant mobile application and/or the computer software to ensure their correct functioning	-	-	-	-
Schedule maintenance and maintain the records	**8**	**12**	**-**	**8**
PC9. schedule the periodic maintenance of sensors and other equipment as per the maintenance schedule suggested by their respective manufacturers	-	-	-	-
PC10. maintain the manual and/or electronic records of the maintenance and tests performed, using the physical registers and/or the relevant computer software	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. maintain electronic records of overall farm operations and create their backup to protect against accidental loss	-	-	-	-
NOS Total	**30**	**40**	**-**	**30**

National Occupational Standards (NOS) Parameters

NOS Code	AGR/N1035
NOS Name	Carry out maintenance of sensors and relevant equipment
Sector	Agriculture
Sub-Sector	Agriculture Crop Production
Occupation	Precision Farming
NSQF Level	5
Credits	2
Version	1.0
Last Reviewed Date	NA
Next Review Date	05/01/2026
NSQC Clearance Date	05/01/2023

AGR/N1036: Use the relevant mobile apps and e-payment methods

Description

This OS unit is about using a range of government-approved mobile apps for achieving efficiency in farming activities. It also covers the use of different e-payment methods.

Scope

The scope covers the following :

- Use the mobile apps
- Carry out app updates and minor troubleshooting
- Use e-payment methods

Elements and Performance Criteria

Use the mobile apps

To be competent, the user/individual on the job must be able to:

PC1. use the relevant and government-approved mobile applications such as Kisan Suvidha for receiving information about agricultural practices, relevant schemes, and the latest updates regarding the agriculture sector

PC2. plan agricultural activities based on the weather information provided by the relevant mobile app

PC3. identify the sellers of agricultural inputs such as seeds, fertilizers, pesticides, plant protection equipment and farm machineries through the relevant mobile app

PC4. determine the prevalent prices of a variety of agricultural inputs in the registered and relevant markets through the relevant mobile app

PC5. follow the guidelines provided by the mobile app for Integrated Pest and Disease Management (IPDM)

PC6. follow the best agricultural practices suggested in the Agro Advisory mobile app, along with the various package of practices for different crops available through the relevant mobile app

PC7. use the relevant and dedicated agricultural crop-related apps, such as Paddy Expert System, Rice Expert, Cane Adviser, etc.

PC8. use the Pashu Poshan app for the effective health management of livestock

PC9. use the Soil Health Card (SHC) scheme provided by the government through the SHC mobile app to monitor and maintain soil health in agricultural fields

PC10. use the Crop Cutting Experiments (CCE) mobile app for capturing the relevant GPS coordinates from the field and crop cutting experiment data

PC11. use the relevant mobile app to identify the appropriate cold storage and godowns in the vicinity for storing the harvested agricultural produce appropriately

PC12. determine the prices of a variety of agricultural produce in different states and districts using the Digital Mandi India mobile app

PC13. use the relevant mobile app, such as National Agriculture Market (eNAM), to identify and market agricultural produce to the relevant buyers, such as local traders, exporters, etc.

PC14. utilise the Kisan Call Centre (KCC) service through the mobile app to connect with the relevant experts and seek advice

PC15. use the relevant mobile app such as Pusa Krishi to get information regarding resource-conserving cultivation practices, farm machineries and their implementation, and production technologies

Carry out app updates and minor troubleshooting

To be competent, the user/individual on the job must be able to:

PC16. identify the need to install mobile app updates for the relevant mobile apps and install the updates as per the instructions given in the app

PC17. carry out troubleshooting for common and minor issues experienced with mobile apps following the developers' instructions available in the relevant apps

PC18. coordinate with the customer services offered by the concerned app to resolve any complex issues with the mobile apps

Use e-payment methods

To be competent, the user/individual on the job must be able to:

PC19. use debit card to withdraw cash at the Automated Teller Machine (ATM)

PC20. use the appropriate electronic payment services, such as National Electronic Fund Transfer (NEFT), Aadhaar-Enabled Payment Services (AEPS), Immediate Payment Service (IMPS), Unified Payment Interface (UPI) mobile apps, etc.

PC21. maintain the record of payments manually and/or electronically using the physical registers and the appropriate computer software

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the benefits of using a variety of mobile apps for efficient exchange of information, and improvement in farming practices and production

KU2. the importance of using government-approved mobile apps to receive authentic information

KU3. how to use the Kisan Suvidha app for receiving information about agricultural practices, relevant schemes, and the latest updates regarding the agriculture sector

KU4. the importance of planning agricultural activities based on the weather information provided by the relevant mobile app

KU5. the advantages of identifying the sellers of agricultural inputs such as seeds, fertilizers, pesticides, plant protection equipment and farm machineries through the relevant and government-approved mobile app

KU6. the relevant mobile app to be used to determine the prevalent prices of a variety of agricultural inputs in the registered and relevant markets

KU7. the relevant mobile app to be used for accessing guidelines on Integrated Pest and Disease Management (IPDM)

KU8. the importance of using follow the best agricultural practices and package of practices for different crops suggested in the Agro Advisory mobile app

KU9. how to use the relevant and dedicated agricultural crop-related apps, such as Paddy Expert System, riceXpert, Cane Adviser, etc.

KU10. how to use the Pashu Poshan app for the effective health management of livestock

KU11. the importance of using the Soil Health Card (SHC) scheme provided by the government through the SHC mobile app to monitor and maintain soil health in agricultural fields

KU12. the use of the Crop Cutting Experiments (CCE) mobile app for capturing the relevant GPS coordinates from the field and crop cutting experiment data

KU13. the relevant mobile app to be used to identify the appropriate cold storage and godowns for storing the harvested agricultural produce

KU14. the advantage of using the Digital Mandi India mobile app

KU15. how to use the National Agriculture Market (eNAM) app for identifying the relevant buyers and marketing agricultural produce to them

KU16. the benefits of using the Kisan Call Centre (KCC) service

KU17. the use of the Pusa Krishi app to get information regarding resource-conserving cultivation practices, farm machineries and their implementation, and production technologies

KU18. the importance of checking for mobile app updates and updating the mobile apps regularly

KU19. how to troubleshoot common and minor issues experienced with mobile apps

KU20. how to use a debit card to withdraw cash at an ATM

KU21. how to use different electronic payment services, such as NEFT, IMPS, UPI mobile apps, etc.

KU22. the importance of maintaining the record of payments using the physical registers and the appropriate computer software

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records

GS2. communicate politely and professionally

GS3. read the relevant literature to learn about the latest developments in the field of work

GS4. perform work-related calculations

GS5. listen attentively to understand the information/ instructions being shared

GS6. plan and prioritise tasks to ensure timely completion

GS7. co-ordinate with the co-workers to achieve the work objectives

GS8. evaluate all possible solutions to a problem to select the best one

GS9. identify possible disruptions to work and take appropriate preventive measures

GS10. take quick decisions to deal with workplace emergencies/ accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Use the mobile apps	**18**	**24**	**-**	**18**
PC1. use the relevant and government-approved mobile applications such as Kisan Suvidha for receiving information about agricultural practices, relevant schemes, and the latest updates regarding the agriculture sector	-	-	-	-
PC2. plan agricultural activities based on the weather information provided by the relevant mobile app	-	-	-	-
PC3. identify the sellers of agricultural inputs such as seeds, fertilizers, pesticides, plant protection equipment and farm machineries through the relevant mobile app	-	-	-	-
PC4. determine the prevalent prices of a variety of agricultural inputs in the registered and relevant markets through the relevant mobile app	-	-	-	-
PC5. follow the guidelines provided by the mobile app for Integrated Pest and Disease Management (IPDM)	-	-	-	-
PC6. follow the best agricultural practices suggested in the Agro Advisory mobile app, along with the various package of practices for different crops available through the relevant mobile app	-	-	-	-
PC7. use the relevant and dedicated agricultural crop-related apps, such as Paddy Expert System, Rice Expert, Cane Adviser, etc.	-	-	-	-
PC8. use the Pashu Poshan app for the effective health management of livestock	-	-	-	-
PC9. use the Soil Health Card (SHC) scheme provided by the government through the SHC mobile app to monitor and maintain soil health in agricultural fields	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. use the Crop Cutting Experiments (CCE) mobile app for capturing the relevant GPS coordinates from the field and crop cutting experiment data	-	-	-	-
PC11. use the relevant mobile app to identify the appropriate cold storage and godowns in the vicinity for storing the harvested agricultural produce appropriately	-	-	-	-
PC12. determine the prices of a variety of agricultural produce in different states and districts using the Digital Mandi India mobile app	-	-	-	-
PC13. use the relevant mobile app, such as National Agriculture Market (eNAM), to identify and market agricultural produce to the relevant buyers, such as local traders, exporters, etc.	-	-	-	-
PC14. utilise the Kisan Call Centre (KCC) service through the mobile app to connect with the relevant experts and seek advice	-	-	-	-
PC15. use the relevant mobile app such as Pusa Krishi to get information regarding resource-conserving cultivation practices, farm machineries and their implementation, and production technologies	-	-	-	-
Carry out app updates and minor troubleshooting	**6**	**8**	**-**	**6**
PC16. identify the need to install mobile app updates for the relevant mobile apps and install the updates as per the instructions given in the app	-	-	-	-
PC17. carry out troubleshooting for common and minor issues experienced with mobile apps following the developers' instructions available in the relevant apps	-	-	-	-
PC18. coordinate with the customer services offered by the concerned app to resolve any complex issues with the mobile apps	-	-	-	-
Use e-payment methods	**6**	**8**	**-**	**6**
PC19. use debit card to withdraw cash at the Automated Teller Machine (ATM)	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. use the appropriate electronic payment services, such as National Electronic Fund Transfer (NEFT), Aadhaar-Enabled Payment Services (AEPS), Immediate Payment Service (IMPS), Unified Payment Interface (UPI) mobile apps, etc.	-	-	-	-
PC21. maintain the record of payments manually and/or electronically using the physical registers and the appropriate computer software	-	-	-	-
NOS Total	**30**	**40**	**-**	**30**

National Occupational Standards (NOS) Parameters

NOS Code	AGR/N1036
NOS Name	Use the relevant mobile apps and e-payment methods
Sector	Agriculture
Sub-Sector	Agriculture Crop Production
Occupation	Precision Farming
NSQF Level	5
Credits	2
Version	1.0
Last Reviewed Date	NA
Next Review Date	05/01/2026
NSQC Clearance Date	05/01/2023

AGR/N9903: Maintain health and safety at the workplace

Description

This OS is about maintaining health and safety of self and other co-workers at the workplace

Scope

The scope covers the following :

- Maintain personal hygiene
- Maintain clean and safe workplace
- Administer appropriate emergency procedures

Elements and Performance Criteria

Maintain personal hygiene

To be competent, the user/individual on the job must be able to:

PC1. wash hands, legs and face with soap/alcohol based sanitizer at reasonable intervals

PC2. wash the worn clothes with soap and sun dry before use next time

PC3. ensure the face is covered with mask or three layers of cloth-piece

PC4. follow the workplace sanitization norms including distancing from sick people

Maintain clean and safe workplace

To be competent, the user/individual on the job must be able to:

PC5. carry out basic safety checks before operation of all tools, implements, and machinery and report identified hazards to the supervisor

PC6. wear appropriate Personal Protective Equipment (PPE) while performing work in accordance with the workplace policy

PC7. follow the instructions mentioned on the labels of chemicals/pesticides/fumigants etc to avoid hazards

PC8. assess risks prior to performing manual handling jobs, and work according to currently recommended safe practices

PC9. sanitize equipment, tools and machinery before and after use

PC10. use equipment and materials safely and correctly and return the same to designated storage after use

PC11. dispose waste safely and correctly in the designated area

PC12. recognize risks to bystanders and take required action to reduce the risks

PC13. work in a manner which minimizes environmental damage, ensuring all procedures and instructions for controlling risks are followed

PC14. report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger

PC15. follow government / workplace advisories incase of outbreak of any disease/disaster

Administer appropriate emergency procedures

To be competent, the user/individual on the job must be able to:

PC16. follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to the location of emergency, as per the workplace requirements

PC17. use emergency equipment in accordance with manufacturer's specifications and workplace requirements

PC18. provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques

PC19. recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate

PC20. report details of first aid administered in accordance with workplace procedures

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant legislation, standards, policies, and procedures at work

KU2. relevant health and safety requirements applicable to the work environment

KU3. own job role and responsibilities and sources of information pertaining to work

KU4. who to approach for support in order to obtain work related information, clarifications and support

KU5. importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business

KU6. personal hygiene and fitness requirement

KU7. importance of sanitization of the workplace

KU8. types of Personal Protective Equipment (PPE) required at the workplace and their importance

KU9. the correct and safe way to use materials and equipment required for the work

KU10. the importance of good housekeeping at the workplace

KU11. safe waste disposal methods

KU12. methods for minimizing environmental damage during work

KU13. the risks to health and safety including contagious diseases and the measures to be taken to control those risks in the area of work

KU14. workplace procedures and requirements for the prevention and treatment of workplace injuries/illnesses.

KU15. basic emergency first aid procedure

KU16. local emergency services

KU17. why accidents, incidents and problems should be reported and the appropriate actions to be taken

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. record the data as per the requirement

GS2. report problems to the appropriate personnel in a timely manner

GS3. read instruction manual for hand tool and equipments
GS4. communicate clearly and effectively with co-workers, and other stakeholders
GS5. comprehend information shared by senior people and experts
GS6. make decisions pertaining to personal hygiene and safety
GS7. schedule daily activities and draw up priorities
GS8. manage relationships with co-workers, manager and other stakeholders
GS9. assess situation and identify appropriate control measures

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Maintain personal hygiene	**10**	**5**	**-**	**10**
PC1. wash hands, legs and face with soap/alcohol based sanitizer at reasonable intervals	-	-	-	-
PC2. wash the worn clothes with soap and sun dry before use next time	-	-	-	-
PC3. ensure the face is covered with mask or three layers of cloth-piece	-	-	-	-
PC4. follow the workplace sanitization norms including distancing from sick people	-	-	-	-
Maintain clean and safe workplace	**15**	**15**	**-**	**15**
PC5. carry out basic safety checks before operation of all tools, implements, and machinery and report identified hazards to the supervisor	-	-	-	-
PC6. wear appropriate Personal Protective Equipment (PPE) while performing work in accordance with the workplace policy	-	-	-	-
PC7. follow the instructions mentioned on the labels of chemicals/pesticides/fumigants etc to avoid hazards	-	-	-	-
PC8. assess risks prior to performing manual handling jobs, and work according to currently recommended safe practices	-	-	-	-
PC9. sanitize equipment, tools and machinery before and after use	-	-	-	-
PC10. use equipment and materials safely and correctly and return the same to designated storage after use	-	-	-	-
PC11. dispose waste safely and correctly in the designated area	-	-	-	-
PC12. recognize risks to bystanders and take required action to reduce the risks	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. work in a manner which minimizes environmental damage, ensuring all procedures and instructions for controlling risks are followed	-	-	-	-
PC14. report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger	-	-	-	-
PC15. follow government / workplace advisories incase of outbreak of any disease/disaster	-	-	-	-
Administer appropriate emergency procedures	**15**	**5**	**-**	**10**
PC16. follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to the location of emergency, as per the workplace requirements	-	-	-	-
PC17. use emergency equipment in accordance with manufacturer's specifications and workplace requirements	-	-	-	-
PC18. provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques	-	-	-	-
PC19. recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate	-	-	-	-
PC20. report details of first aid administered in accordance with workplace procedures	-	-	-	-
NOS Total	**40**	**25**	**-**	**35**

National Occupational Standards (NOS) Parameters

NOS Code	AGR/N9903
NOS Name	Maintain health and safety at the workplace
Sector	Agriculture
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	1
Version	4.0
Last Reviewed Date	22/10/2024
Next Review Date	22/10/2027
NSQC Clearance Date	22/10/2024

DGT/VSQ/N0103: Employability Skills (90 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

To be competent, the user/individual on the job must be able to:

PC1. understand the significance of employability skills in meeting the current job market requirement and future of work

PC2. identify and explore learning and employability relevant portals

PC3. research about the different industries, job market trends, latest skills required and the available opportunities

Constitutional values – Citizenship

To be competent, the user/individual on the job must be able to:

PC4. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.

PC5. follow environmentally sustainable practices

Becoming a Professional in the 21st Century

To be competent, the user/individual on the job must be able to:

PC6. recognize the significance of 21st Century Skills for employment

PC7. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

PC8. adopt a continuous learning mindset for personal and professional development

Basic English Skills

To be competent, the user/individual on the job must be able to:

PC9. use basic English for everyday conversation in different contexts, in person and over the telephone

PC10. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC11. write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

To be competent, the user/individual on the job must be able to:

PC12. identify career goals based on the skills, interests, knowledge, and personal attributes

PC13. prepare a career development plan with short- and long-term goals

Communication Skills

To be competent, the user/individual on the job must be able to:

PC14. follow verbal and non-verbal communication etiquette while communicating in professional and public settings

PC15. use active listening techniques for effective communication

PC16. communicate in writing using appropriate style and format based on formal or informal requirements

PC17. work collaboratively with others in a team

Diversity & Inclusion

To be competent, the user/individual on the job must be able to:

PC18. communicate and behave appropriately with all genders and PwD

PC19. escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

To be competent, the user/individual on the job must be able to:

PC20. identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.

PC21. carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook

PC22. identify common components of salary and compute income, expenses, taxes, investments etc

PC23. identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

To be competent, the user/individual on the job must be able to:

PC24. operate digital devices and use their features and applications securely and safely

PC25. carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.

PC26. display responsible online behaviour while using various social media platforms

PC27. create a personal email account, send and process received messages as per requirement

PC28. carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications

PC29. utilize virtual collaboration tools to work effectively

Entrepreneurship

To be competent, the user/individual on the job must be able to:

PC30. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research

PC31. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

PC32. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

To be competent, the user/individual on the job must be able to:

PC33. identify different types of customers and ways to communicate with them

PC34. identify and respond to customer requests and needs in a professional manner

PC35. use appropriate tools to collect customer feedback

PC36. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

To be competent, the user/individual on the job must be able to:

PC37. create a professional Curriculum vitae (Résumé)

PC38. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC39. apply to identified job openings using offline /online methods as per requirement

PC40. answer questions politely, with clarity and confidence, during recruitment and selection

PC41. identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills and different learning and employability related portals

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

KU6. importance of career development and setting long- and short-term goals

KU7. about effective communication

KU8. POSH Act

KU9. Gender sensitivity and inclusivity

KU10. different types of financial institutes, products, and services

KU11. components of salary and how to compute income and expenditure
KU12. importance of maintaining safety and security in offline and online financial transactions
KU13. different legal rights and laws
KU14. different types of digital devices and the procedure to operate them safely and securely
KU15. how to create and operate an e- mail account
KU16. use applications such as word processors, spreadsheets etc.
KU17. how to identify business opportunities
KU18. types and needs of customers
KU19. how to apply for a job and prepare for an interview
KU20. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and write different types of documents/instructions/correspondence in English and other languages
GS2. communicate effectively using appropriate language in formal and informal settings
GS3. behave politely and appropriately with all to maintain effective work relationship
GS4. how to work in a virtual mode, using various technological platforms
GS5. perform calculations efficiently
GS6. solve problems effectively
GS7. pay attention to details
GS8. manage time efficiently
GS9. maintain hygiene and sanitization to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. understand the significance of employability skills in meeting the current job market requirement and future of work	-	-	-	-
PC2. identify and explore learning and employability relevant portals	-	-	-	-
PC3. research about the different industries, job market trends, latest skills required and the available opportunities	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC4. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC5. follow environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**1**	**3**	**-**	**-**
PC6. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC7. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
PC8. adopt a continuous learning mindset for personal and professional development	-	-	-	-
Basic English Skills	**3**	**4**	**-**	**-**
PC9. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC11. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
Career Development & Goal Setting	**1**	**2**	**-**	**-**
PC12. identify career goals based on the skills, interests, knowledge, and personal attributes	-	-	-	-
PC13. prepare a career development plan with short- and long-term goals	-	-	-	-
Communication Skills	**2**	**2**	**-**	**-**
PC14. follow verbal and non-verbal communication etiquette while communicating in professional and public settings	-	-	-	-
PC15. use active listening techniques for effective communication	-	-	-	-
PC16. communicate in writing using appropriate style and format based on formal or informal requirements	-	-	-	-
PC17. work collaboratively with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**1**	**-**	**-**
PC18. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC19. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
Financial and Legal Literacy	**2**	**3**	**-**	**-**
PC20. identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.	-	-	-	-
PC21. carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC23. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	**3**	**5**	**-**	**-**
PC24. operate digital devices and use their features and applications securely and safely	-	-	-	-
PC25. carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.	-	-	-	-
PC26. display responsible online behaviour while using various social media platforms	-	-	-	-
PC27. create a personal email account, send and process received messages as per requirement	-	-	-	-
PC28. carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications	-	-	-	-
PC29. utilize virtual collaboration tools to work effectively	-	-	-	-
Entrepreneurship	**2**	**3**	**-**	**-**
PC30. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC31. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC32. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC33. identify different types of customers and ways to communicate with them	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC34. identify and respond to customer requests and needs in a professional manner	-	-	-	-
PC35. use appropriate tools to collect customer feedback	-	-	-	-
PC36. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
PC37. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC38. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC39. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC40. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC41. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0103
NOS Name	Employability Skills (90 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	5
Credits	3
Version	1.0
Last Reviewed Date	15/03/2024
Next Review Date	15/03/2027
NSQC Clearance Date	15/03/2024

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.

2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.

3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).

4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.

5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

Minimum Aggregate Passing % at QP Level : 70

(**Please note**: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
AGR/N1033.Collect data from the field using precision farming technologies	30	40	-	30	100	20
AGR/N1034.Analyse and utilise the data collected from the field	30	40	-	30	100	20
AGR/N1035.Carry out maintenance of sensors and relevant equipment	30	40	-	30	100	20
AGR/N1036.Use the relevant mobile apps and e-payment methods	30	40	-	30	100	20
AGR/N9903.Maintain health and safety at the workplace	40	25	-	35	100	10
DGT/VSQ/N0103.Employability Skills (90 Hours)	20	30	-	-	50	10
Total	**180**	**215**	**-**	**155**	**550**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
PPE	Personal Protective Equipment
PPE	Personal Protective Equipment

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.