Model Curriculum

QP Name: Repair and Maintenance Technician (Farm Machinery)

QP Code: AGR/Q1106

Version: 4.0

NSQF Level: 4

Model Curriculum Version: 4.0

Agriculture Skill Council of India || Agriculture Skill Council of India (ASCI), 6th Floor, GNG Tower, Plot No. 10, Sector - 44

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Training Parameters

Sector	Agriculture
Sub-Sector	Agriculture Crop Production
Occupation	Farm Machinery, Equipment Operation and maintenance
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7233.2800
Minimum Educational Qualification and Experience	12th grade Pass OR 10th grade pass with 3 years of relevant experience in Agriculture and allied sectors OR Previous relevant Qualification of NSQF Level (3.5) with 1.5 Years of relevant experience in Agriculture and allied sectors OR Previous relevant Qualification of NSQF Level (Level 3) with 3 years of relevant experience in in Agriculture and allied sectors
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	30/05/2024
Next Review Date	30/11/2024
NSQC Approval Date	30/05/2024
QP Version	4.0
Model Curriculum Creation Date	30/05/2024

Model Curriculum Valid Up to Date	30/11/2024
Model Curriculum Version	3.0
Minimum Duration of the Course	390 Hours
Maximum Duration of the Course	390 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:

- Discuss the role and responsibilities of a Repair and Maintenance Technician- Farm Machinery.
- Demonstrate the general repair and maintenance works for the farm equipment/machineries.
- Demonstrate how to carry out repair and maintenance of tillage and soil farming equipment.
- Show how to carry out repair and maintenance of seed drills and planters.
- Show how to carry out repair and maintenance of plant protection equipment.
- Demonstrate how to carry out repair and maintenance of the harvesting and post-harvest machineries.
- Demonstrate documentation and record-keeping of activities in a digital format
- Discuss ways to communicate effectively at the workplace.
- Explain the health, hygiene and safety measures to be adopted at 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/N1151 General repair and maintenance work of farm equipment/machinery V1.0 **NSQF Level-4**	**20:00**	**40:00**	**0:00**	**0:00**	**60:00**
Module 1: Introduction to the role of a Repair and Maintenance Technician- Farm Machinery	5:00	0:00	0:00	0:00	5:00
Module 2: General repair and maintenance of the farm equipment/ machinery	15:00	40:00	0:00	0:00	55:00

AGR/N1152 Troubleshooting, repair and maintenance of farm equipment/machinery V1.0 **NSQF Level-4**	**55:00**	**65:00**	**0:00**	**0:00**	**120:00**
Module 3: Repair and maintenance of the tillage machineries	15:00	15:00	0:00	0:00	30:00
Module 4: Repair and maintenance of seed drills and planters	10:00	20:00	0:00	0:00	30:00
Module 5: Repair and maintenance of the plant protection equipment	10:00	10:00	0:00	0:00	20:00
Module 6: Repair and maintenance of the harvesting and post-harvest machineries	20:00	20:00	0:00	0:00	40:00
AGR/N1153 Digitized documentation and record keeping of repair and maintenance activities V1.0 **NSQF Level-4**	**15:00**	**15:00**	**0:00**	**0:00**	**30:00**
Module 7: Digitized documentation and record-keeping	15:00	15:00	0:00	0:00	30:00
AGR/N9903 Maintain health and safety at the workplace V3.0 **NSQF Level-4**	**15:00**	**15:00**	**0:00**	**0:00**	**30:00**
Module 8: Hygiene and cleanliness	03:00	03:00	0:00	0:00	06:00
Module 9: Safety and emergency procedures	12:00	12:00	0:00	0:00	24:00
DGT/VSQ/N0102 Employability Skills **NOS Version-1.0** **NSQF Level-4**	**60:00**	**00:00**	**0:00**	**0:00**	**60:00**
Module 10: Employability Skills	60:00	00:00	0:00	0:00	60:00

Total Duration	**165:00**	**135:00**	**90:00**	**0:00**	**300:00**

Module Details

Module 1: Introduction to the role of a Repair and Maintenance Technician- Farm Machinery

Bridge Module, Mapped to AGR/N1151 v1.0

Terminal Outcomes:

- Discuss the roles and responsibilities of a Repair and Maintenance Technician - Farm Machinery.

Duration: 5:00	**Duration: 0:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the size and scope of the agriculture industry and its sub-sectors. • Explain the role and responsibilities of a Repair and Maintenance Technician - Farm Machinery. • Identify various employment opportunities for a Repair and Maintenance Technician in the agriculture industry. • Explain the importance of individual's role in the workflow.	
Classroom Aids	
Training kit - Trainer guide, presentations, whiteboard, marker, projector, laptop, video films	
Tools, Equipment and Other Requirements	
NA	

Module 2: General Repair and maintenance work of farm equipment/machinery

Mapped to AGR/N1151 v1.0

Terminal Outcomes:

- Perform troubleshooting for identifying the issues with the equipment//machinery
- Perform disassembly the equipment to access the issue
- Perform repair or replacement of the damaged parts
- Perform reassembly of the equipment post resolving the issue
- Undertake testing and adjustment
- Perform regular inspections
- Perform lubrication to reduce friction and wear
- Perform fluid checks and replacements
- Perform filter replacements for ensuring optimal performance

Duration: 15:00	**Duration**: 40:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe common failure modes and symptoms in farm equipment/machinery • Explain the use of diagnostic tools for troubleshooting • Describe the troubleshooting procedures • Explain the mechanical Systems- engines, transmissions, and drive systems • Describe the working of gears, belts, chains, pulleys, nearing and bushings • Explain the properties of different metals and materials used in machinery. • Describe welding and fabrication techniques. • Explain principles of hydraulic systems and components • Describe hydraulic fluid properties, pressures, and flow rates • Explain pneumatic systems and components • Explain the working of air compressors, valves, and actuators. • Describe electrical Systems-electrical circuits, wiring, and components. • Explain AC/DC systems, voltage, and current, battery maintenance • Explain the working of sensors, control units, and circuit boards. • List the diagnostic tools and software for	• Identify symptoms of malfunction such as unusual noises, reduced performance, or system errors. • Use diagnostic tools to identify specific issues • Disassemble equipment to access damaged or malfunctioning components • Replace worn-out or damaged parts like belts, bearings, gears, and blades. • Demonstrate the correct installation of new parts for proper functionality. • Perform welding to fix broken metal components. • Fabricate custom parts if required to fit unique machinery specifications. • Repair or replace damaged wiring, connectors, and electrical components. • Address issues with sensors, control units, and electrical circuits. • Fix leaks in hoses, seals, and other hydraulic components. • Replace faulty hydraulic pumps, cylinders, and valves • Put equipment back together after repairs, ensuring proper functionality • Test repaired equipment to ensure it operates correctly and make necessary adjustments

electronic systems. • Describe the use of multimeters and other testing equipment for troubleshooting electrical issues • Explain common electrical problems and solutions. • Describe the Internal Combustion Engines- gasoline and diesel engine operation. • Explain engine components like pistons, crankshafts, and camshafts. • Explain fuel Systems-carburetors, fuel injection systems, and fuel pumps. • Describe fuel types and their properties. • Explain power Transmission-clutches, gearboxes, and differentials • Explain the working of drive shafts, axles, and universal joints • Describe hydraulic Systems-hydraulic pumps, cylinders, and valves. • Explain Pneumatic Systems-compressors, air tanks, and pneumatic tools. • Explain air pressure regulation and control • Explain the routine maintenance tasks and schedules • Describe lubrication, cleaning, and inspection techniques • Explain the types and properties of lubricants • Explain lubrication schedules and techniques to reduce wear and friction • Describe cleaning techniques for different components. • Explain the method of rust prevention and treatment. • Describe necessary adjustments and calibrations for optimal performance. • Explain aligning, tensioning, and setting clearances. • List the common repair tools and equipment. • Explain part replacement and alignment procedures. • Describe the best practices for maintaining different types of equipment. • Explain the importance of regular maintenance for longevity and efficiency • Describe the safety protocols and protective equipment.	• Operate farm machinery to conduct maintenance tasks • Conduct routine inspections of all machinery components. • Look for signs of wear, damage, or potential issues. • Lubricate moving parts to minimize friction and wear. • Use appropriate lubricants for different machinery parts. • Clean equipment to remove dirt, debris, and residues that can affect performance. • Ensure air filters and cooling systems are free from obstructions. • Adjust settings, alignments, and tensions to ensure optimal operation. • Calibrate sensors, control systems, and other adjustable components. • Check and replenish fluids such as oil, hydraulic fluid, and coolant. • Replace fluids according to the manufacturer's guidelines

• Describe the emergency procedures and first aid. • Explain environmental regulations affecting machinery use • Explain industry standards and manufacturer specifications. • Describe the certification and inspection requirements • Explain how equipment is used in various farming operations • Describe crop cycles and seasonal equipment demands • Explain how weather and soil conditions affect machinery • Describe the modifications and adjustments required for different terrains	
Classroom Aids	
Training kit (trainer guide, presentations), whiteboard, marker, projector, laptop	
Tools, Equipment and Other Requirements	
• Various types of farm equipment/machineries, lubricants • Hand tools: A variety of wrenches, pliers, screwdrivers, and other hand tools. • Power tools: Drills, grinders, impact wrenches, and other power tools. • Diagnostic equipment • Welding equipment	

Module 3: Repair and maintenance of the tillage machineries

Mapped to AGR/N1152 v1.0

Terminal Outcomes:

- Explain the design and functions of the tillage machineries.
- Demonstrate the process of checking the mouldboard plough, disc plough, disc harrow and cultivator for faults, wear and tear or damage.
- Show how to repair and maintain the mouldboard plough, disc plough, disc harrow and cultivator.

Duration: 15:00	**Duration**: 15:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the design and function of the primary and secondary tillage machinery. • Identify various components of a mouldboard plough, disc plough, disc harrow and cultivator. • Explain the repair and maintenance needs of a mouldboard plough, disc plough, disc harrow and cultivator. • State the importance of carrying out regular service and maintenance of the tillage machinery. • Explain the correct handling of various service and maintenance tools and equipment. • Describe the process of adjusting the gauge and wheels disc, tilt angle and the working depth of tillage machinery. • Discuss the Dangerous Machines (Regulation) Act, 1983. • Describe the correct process to hitch and unhitch implements.	• Check the mouldboard plough for smooth movement. • Show how to remove soil and any other waste from the mouldboard plough. • Apply the recommended grade of lubricant on mouldboard plough, bearings, bearing housing, bearing assembly, mating parts, coulter hub and all greasing points. • Show how to sharpen the bar point, harrow discs and shares. • Demonstrate how to apply the necessary adjustment to the level of the plough, horizontal suction, vertical suction and draft of the plough. • Demonstrate how to carry out the installation of new parts to replace the worn-out or damaged parts. • Analyse all the nuts, bolts, bearings and castle nuts for locking and recommended torque. • Show how to clean the disc plough hub using diesel oil. • Demonstrate how to apply the necessary adjustment to the horizontal disc angle, vertical tilt angle, the width of cut, level of plough and scrapper position as per the service manual. • Show how to change the degree of hub by loosening the mounting bolts

	when the diameter of the disc reduces below the prescribed level. • Show how to apply the recommended grade of lubricant on bearings, bearing housing, coulter hub and all greasing points. • Analyse the disc gang angle and gang assembly for wear and tear or damage. • Analyse the scrapper for correct assembly. • Evaluate the performance of the depth control system. • Evaluate the disc spacing and diameter is as prescribed. • Show how to carry out welding on the broken joints. • Show how to carry out the installation of new discs, shovel points, disc plough hub seal, grease nipple, spool flanges, gang-bolts, gang bearings, pins, nuts and bolts to replace the ones worn out or damaged. • Analyse the level of the cultivator to ensure all the shovels touch the ground. • Analyse the shovel for the correct angle and the tyres for uniform spacing. • Demonstrate the process of cleaning the cultivator to remove accumulated soil, trash or grease on it.
Classroom Aids	
Training kit (trainer guide, presentations), whiteboard, marker, projector, laptop	
Tools, Equipment and Other Requirements	
Mouldboard plough, disc plough, disc harrow, cultivator, tools such as screwdriver set, pliers set, hammer set, set of chisels, set of files, hand hacksaw, set of spanners, set of sockets, set of pullers, pipe wrench, adjustable screw wrench, chisel set, tongs, hand grease gun, bench vice, micrometer, Vernier calipers, screw jack, hydraulic jack, air compressor, washing machine, welding machine, pullers, anvil, cotton, jute etc.	

Module 4: Repair and maintenance of seed drills and planters

Mapped to ARG/N1152 v2.0

Terminal Outcomes:

- Describe the process of examining the power transmission system, seed and fertilizer boxes, tubes, metering and application equipment.
- Demonstrate the process of carrying out repair and maintenance of the power transmission system, seed and fertilizer boxes, tubes, metering and application equipment.

Duration: 10:00	**Duration**: 20:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the design and functions of various components of the seed and fertilizer box and tubes, power transmission system, seed and fertilizer metering and application equipment. • Explain the common repair and maintenance needs of the seed and fertilizer box and tubes, power transmission system, seed and fertilizer metering and application equipment. • Explain the use of various attachments used with seed drills and planters. • Explain the relevant adjustments required to be made to the seed drill and planters for their optimum performance.	• Demonstrate how to clean the metering roller, seed and fertilizer boxes, seed and fertilizer application equipment. • Check drive, feed shafts and rotary tiller for unrestricted movement. • Inspect the axle of the wheel for any bends or damages. • Examine all sprockets for firm connection with their shafts. • Demonstrate how to apply necessary adjustments to align sprockets of drive wheel with feed shafts, chain and idler sprocket. • Show how to apply grease/ lubricant on seed/ fertilizer boxes, metering rollers, drive, feed shafts, rotary tiller, fertilizer and seed application equipment. • Show how to install a new axle of wheel to replace the bent or damaged one. • Examine the rings and spoons for any wear and tear or damage. • Check the drive belt for the required level of tension. • Check the lever for free movement on both sides of the fertilizer box. • Inspect the bed shaper for the correct position. • Show how to adjust the seed and fertilizer application rate to the recommended settings.

	• Demonstrate setting the sprocket in the seeding equipment and spacing between furrow openers and ridgers as per the requirement. • Demonstrate setting the rings at an equal distance in the seed cups. • Analyse all the nuts and bolts in the seed and fertilizer metering and application systems for the prescribed level of torque and locking. • Inspect the seed/ fertilizer tubes for bends/ wear and tear/ damage. • Demonstrate the process of installing new seed/ fertilizer tubes to replace the worn-out or damaged ones. • Demonstrate setting the seed/ fertilizer tubes with seed/fertilizer cups firmly. • Demonstrate ways to protect tubes from bending and breakage.
Classroom Aids	
Training kit (Trainer guide, Presentations). Whiteboard, Marker, projector, laptop	
Tools, Equipment and Other Requirements	
Seed drill, planter, metering Systems for seed & Fertilizers, furrow openers, tools such as screwdriver set, pliers set, hammer set, set of chisels, set of files, hand hacksaw, set of spanners, set of sockets, set of pullers, pipe wrench, adjustable screw wrench, chisel set, tongs, hand grease gun, bench vice, micrometer, vernier callipers, screw jack, hydraulic jack, air compressor, washing machine, welding machine, bearing pullers, anvil, cotton jute etc. Stopwatch, Power cutter, Drill machine	

Module 5: Repair and maintenance of the plant protection equipment

Mapped to AGR/N1152 v2.0

Terminal Outcomes:

- Describe the process of conducting regular checks on the plant protection equipment.
- Show how to identify common faults, wear and tear and damage in the plant protection equipment.
- Demonstrate the process of carrying out repair and maintenance of the plant protection equipment.
- Demonstrate ways to use resources optimally in an environment-friendly manner.

Duration: 10:00	**Duration:** 10:00
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the safe handling of various chemicals used in plant protection. • Identify the components of a sprayer and duster along with different types of nozzles. • Explain the common repair and maintenance needs of different types of planting equipment. • Describe the process of detecting defects and making adjustments to various components of the sprayer and duster. • Explain the composition and the process of formulating various plant protection chemicals. • Explain the process of calibrating the plant protection equipment. • Describe the process of giving first-aid and treatment for chemical poisoning. • Explain waste management and different methods of waste disposal. • State the importance of following environmental and ecological best practices to minimise the impact on the environment.	• Demonstrate the process of cleaning the tank, strainers and delivery hoses using clean water. • Analyse the tank for leakage by immersing it in water. • Demonstrate the process of setting the nozzle correctly after cleaning. • Inspect the delivery hose joints, pump assembly, plunger rod, piston parts, gaskets, piston rings, by-pass and cut-off valve and washers for wear and tear or damage. • Analyse all the nuts and bolts are secured tightly. • Check the plant protection equipment, pump lever and lock nut connecting the piston for correct position. • Analyse the equipment belt for the required level of tension. • Show how to apply grease/ lubricant on plunger rod and piston parts.

• Explain the benefits of resource optimisation.	
Classroom Aids	
Training kit (Trainer guide, Presentations)	
Tools, Equipment and Other Requirements	
Sprayer, duster, power sprayer, tools such as screwdriver set, pliers set, hammer set, set of chisels, set of files, hand hacksaw, set of spanners, set of sockets, set of pullers, pipe wrench, adjustable screw wrench, chisel set, tongs, hand grease gun, bench vice, micrometer, vernier callipers, screw jack, hydraulic jack, air compressor, washing machine, welding machine, power cutter, drill machine, pullers, anvil, cotton jute etc.	

Module 6: Repair and maintenance of the harvesting and post-harvest machineries

Mapped to AGR/N1152 v2.0

Terminal Outcomes:

- Describe the process of examining the harvesting and post-harvest machineries to detect malfunctions, wear and tear or damage.
- Demonstrate the process of carrying out repair and maintenance of the harvesting and post-harvest machineries.

Duration: 20:00	**Duration: 20:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of carrying out regular maintenance and repair harvesting and post-harvesting machineries. • Identify various components of reapers and power threshers such as cutter bar, reel/ star wheel, windrower, etc. • Identify various attachments used with post-harvest equipment. • Explain relevant adjustments to be made to operate post-harvest machineries. • Explain the common defects found in reapers, threshers and post-harvest machineries. • Explain the service and maintenance procedures for harvesting and post-harvest machineries. • List various tools and equipment used in the repair and maintenance of the harvesting and post-harvesting machineries. • Describe the process to replace components in different types of reapers, threshers and post-harvest machineries.	• Examine crop-row divider and cutter bar for any wear and tear or damage. • Check the reel belt, thresher belt and v-belt for the required level of tension. • Inspect the drive pulley key and the belt for a secure connection. • Check all the nuts, bolts and reaper components are secured firmly. • Examine the conveyor belt, v-belt, cutter bar, knife, star wheels, pressure springs and lugs for wear and tear or damages. • Demonstrate the process of cleaning the reaper guards and thresher. • Show how to apply paint on the machine body and lubricant on the greasing points • Demonstrate how to adjust the blades and height of the reel to ensure the optimum cut length and correct gathering of crop respectively. • Show how to set the twine tension along with the tension in trigger spring to get the required bundle size. • Evaluate the performance of the feeding mechanism. • Examine the sieve and conclave for

	the correct size. • Demonstrate smoothening of rough grooves on the pulley surface along with the face of pliers. • Show how to adjust the base angle of feeding chute, concave gap and clearance, and the reel height and idler pulley as per the operator's manual. • Demonstrate setting the pegs on the threshing cylinder tightly. • Show how to refill the engine oil and fuel to the recommended levels. • Show how to set the cylinder-concave clearance and sieve slope as per the operator's manual. • Demonstrate the process of setting the recommended speed of blower/aspirator, sieves, and threshing cylinder. • Check the threshing cylinder for correct direction of rotation and any interference by rotating it manually. • Demonstrate the process of setting the recommended speed of blower/aspirator, sieves, and threshing cylinder. • Show how to clean the post-harvesting machineries such as cleaner/ grader, drying equipment, rice/ flour/ spice mill, oil expelling machines, chaff cutters etc. • Check the sieves and hoppers for correct oscillation and any wear and tear/ damage. • Examine the drying chamber, heating system and air distribution system of the dryer for wear and tear and correct functioning. • Inspect the components of mills and oil expelling machines, feeding chute, blade and gear for correct functioning, wear and tear and damage.

	• Demonstrate the process of installing new components to replace the worn-out or damaged ones. • Demonstrate the process of setting the cleaner feed rate, air flow rate, air temperature, grain flow rate in the dryer, plating space, Revolutions Per Minute (RPM), screen size, spacing between rubber rolls, feeding roller gap, cutting gap in chaff cutters, hydraulic press feed rate, operating pressure, moisture and temperature of oilseeds, frequency and amplitude of oscillations to as per the manufacturer's recommendations.
Classroom Aids	
Training kit (Trainer guide, Presentations)	
Tools, Equipment and Other Requirements	
Reaper, thresher, reaper binders, cleaners/ graders, milling machinery, sugarcane crushers and chaff cutters. Drying equipment, dal mill, rice mill, flour mill, Tools such as screwdriver set, pliers set, hammer set, set of chisels, set of files, hand hacksaw, set of spanners, set of sockets, set of pullers, pipe wrench, adjustable screw wrench, chisel set, tongs, hand grease gun, bench vice, micrometer, vernier callipers, screw jack, hydraulic jack, air compressor, washing machine, welding machine, bearing pullers, anvil, cotton jute etc Power cutter, Drill machine	

Module 7: Digitized documentation and record keeping

Mapped to AGR/N1153 v2.0

Terminal Outcomes:

- Perform digital documentation of the inventory and the customer database
- Demonstrate record-keeping of the operational activities

Duration: *15:00*	Duration: *15:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain documentation and record-keeping methods • Describe the use of the relevant computer applications for maintaining business records • List different online cloud storage services for backing up business data and reports • List various electronic payments methods available in India such as Aadhar Enabled Payment System (AEPS), Bharat Interface for Money (BHIM) app, mobile or e-wallets, UPI, USSD, etc. • Describe legal and standard requirements and process with respect to business documentation and record-keeping • Describe details to be recorded in business reports such as data on marketing, logistics, distribution and sale • Explain methods of safe handling and storage of reports and documents	• Use the relevant computer software/ application to prepare and maintain the business records • Show how to maintain the record of various machineries/ tools/ equipment used or hired • Show how to create a database of different manufacturers/ suppliers of various machineries/ tools/equipment including product warranty information, maintenance schedule, contact details, etc. • Show how to maintain the record of farmer visits, frequency of visit, sales/ services along with any other relevant details • Show how to maintain the record of breakdown/ repair/ maintenance of all machineries/ tools/ equipment • Show how to document all maintenance and repair activities in detailed logs • Show how to record parts used, tasks performed, and any issues encountered during maintenance. • Demonstrate the reporting method on the status of work orders to supervisors • Show how to record the payments into and from one's bank account accurately • Show how to create backup of the reports and data in the computer to prevent accidental loss
Classroom Aids:	

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.
Tools, Equipment and Other Requirements
Record-keeping software, payment apps, various types of record books, sample of customer database

Module 8: Hygiene and cleanliness

Mapped to NOS AGR/N9903 v3.0

Terminal Outcomes:

- Discuss how to adhere to personal hygiene practices.
- Demonstrate ways to ensure cleanliness around the workplace.

Duration: *03:00*	Duration: *03:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the requirements of personal health, hygiene and fitness at work. • Describe common health-related guidelines laid down by the organizations/ Government at the workplace • Explain the importance of good housekeeping at the workplace. • Explain the importance of informing the designated authority on personal health issues related to injuries and infectious diseases.	• Demonstrate personal hygiene practices to be followed at the workplace. • Demonstrate the correct way of washing hands using soap and water, and alcohol-based hand rubs. • Demonstrate the steps to follow to put on and take off a mask safely. • Show how to sanitize and disinfect one's work area regularly. • Demonstrate adherence to the workplace sanitization norms. • Show how to ensure cleanliness of the work area.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
Personal Protective Equipment, cleaning equipment and materials, sanitizer, soap, mask	

Module 9: Safety and emergency procedures

Mapped to NOS AGR/N9903 v3.0

Terminal Outcomes:

- Describe how to adhere to safety guidelines.
- Show how to administer appropriate emergency procedures.

Duration: *12:00*	Duration: *12:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the PPE required at the workplace. • Describe the commonly reported hazards at the workplace. • Describe the hazards caused due to chemicals/pesticides/fumigants. • Describe the basic safety checks to be done before the operation of any equipment/machinery. • Describe the common first aid procedures to be followed in case of emergencies. • State measures that can be taken to prevent accidents and damage s at the workplace. • Explain the importance of reporting details of first aid administered, to the reporting officer/doctor, in accordance with workplace procedures • State common health and safety guidelines to be followed at the workplace.	• Check various areas of the workplace for leakages, water-logging, pests, fire, etc. • Demonstrate how to safely use the PPE and implements as applicable to the workplace. • Display the correct way of donning, doffing and discarding PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Sanitize the tools, equipment and machinery properly. • Demonstrate the safe disposal of waste. • Demonstrate procedures for dealing with accidents, fires and emergencies. • Demonstrate emergency procedures to the given workplace requirements. • Demonstrate the use of emergency equipment in accordance with manufacturers' specifications and workplace requirements. • Demonstrate the administration of first aid. • Prepare a list of relevant hotline/ emergency numbers
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
Personal protective equipment, first aid kit, equipment used in medical emergencies.	

Module 10: Employability Skills (60 hours)

Mapped to NOS DGT/VSQ/N0102 v1.0

Duration: 60:00
Key Learning Outcomes

Introduction to Employability Skills Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

Constitutional values - Citizenship Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

Basic English Skills Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

Career Development & Goal Setting Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

Communication Skills Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

Diversity & Inclusion Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

Financial and Legal Literacy Duration:5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

Essential Digital Skills Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

Entrepreneurship Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

Customer Service Duration: 5 Hours

30. Describe the significance of analysing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

Getting Ready for apprenticeship & Jobs Duration: 8 Hours

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
12th Class	Class 12th with Science and having any Certificate in course in Farm Mechanization from recognized institutes	5	Agriculture Farm Machinery	0		Ex-Service-Man including Ex-Paramilitary personnel: Minimum Qualification is 10+2 with an Honourable Discharge/Pension. SSC would consider a relaxation/waiver of sector-specific experience on a case-to-case basis.
Diploma	Diploma (Mechanical / Agriculture engineering)	3	Agriculture Farm Machinery	0		
ITI	ITI (Mechanical / Agriculture engineering)	3	Agriculture Farm Machinery	0		
Graduate	Graduate (Agriculture)	1	Agriculture Farm Machinery	0		For school Program minimum qualification of Trainer should be Graduate (Agriculture / Physics). Their Teaching experience will be considered industry experience
B. Tech	B Tech in Mechanical / Agriculture engineering.	0		0		

Trainer Certification	
Domain Certification	**Platform Certification**
Certified for Job Role "**Repair and Maintenance Technician- Farm Machinery**", mapped to QP: "AGR/Q1106, v4.0", Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: "Trainer (Vet and Skills)", mapped to the Qualification Pack: "MEP/Q2601, v2.0". Minimum accepted score 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***	
Graduation	B. Tech (Agriculture/ Agriculture Engineering/Mechanical Engineering/Farm Machinery)	5	Agriculture/Farm Machinery/Mechanical Engineering and related streams	0		Practical skills and knowledge required in the maintenance of farm machinery
Graduation	B.Sc. (Agriculture / Agriculture Engineering and related streams)	5	Agriculture/Farm Machinery/Mechanical Engineering and related streams	0		Practical skills and knowledge required in the maintenance of farm machinery
Post-graduation	M. Tech (Agriculture/ Agriculture Engineering/Mechanical Engineering/Farm Machinery)	2	Agriculture/Farm Machinery/Mechanical Engineering and related streams	0		Practical skills and knowledge required in the maintenance of farm machinery
Post-graduation	M.Sc. (Agriculture / Agriculture Engineering and related streams)	2	Agriculture/Farm Machinery/Mechanical Engineering and related streams	0		Practical skills and knowledge required in the maintenance of farm machinery

PhD	PhD (Agriculture / Agriculture Engineering/Farm engineering and related streams)	1	Agriculture/Farm Machinery/Mechanical Engineering and related streams	0		Practical skills and knowledge required in the maintenance of farm machinery

Assessor Certification	
Domain Certification	**Platform Certification**
"**Repair and Maintenance Technician- Farm Machinery**", "AGR/Q1106, v4.0", Minimum accepted score is 80%	Certified for the Job Role: "Assessor (Vet and Skills)", mappedto 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:

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 ground through qualified and ToA certified assessors.

While it is important that an individual has adequate knowledge and skills to perform a specific task, weight age for different aspects for assessment are 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 empanelled assessment partners. Based on the results of assessment; ASCI will certify the learners/candidates

Testing Environment

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

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

- Multilingual assessments (ASCI is conducting assessments in 13 + languages pan India)
- Rubric driven assessments in Practical/Viva sections and responses recorded accordingly
- All responses, data, records and feedback stored digitally on 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 training / within 7 days of completion of training.

- Assessment will be conducted at the training venue
- 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 practical 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 question, etc. which will test the trainee on his theoretical knowledge of the subject.
- The theory, practical and viva assessments will be carried out on same day. In case of more number of candidates, number of assessors and venue facilitation be increased and facilitated

Assessment			
Assessment Type	**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 usability of job roles/advantages /importance of adherence to procedures. Viva will be used to gauge trainee's confidence and correct knowledge in handling job situation

The question paper 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 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 which 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 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 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, do's and don'ts, subjective questions to check understanding of practical tasks.

Assessor has to go through orientation program organized by Assessment Agency. The training would give an overview to the assessors on the overall framework of QP evaluation. Assessor shall be given a NOS and PC level overview of each QP as applicable. 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 which will maintain standardization of marking scheme.

Type of Evidence and Evidence Gathering Protocol:

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

- Geo Tagging to track ongoing assessment
- AA's coordinator emails the list of documents and evidences (photos and videos) to the assessor one day prior to the assessment. List is mentioned below:
    - Signed Attendance sheet
    - Assessor feedback sheet
    - Candidate feedback sheet
    - Assessment checklist for assessor
    - Candidate Aadhar/ID card verification
    - Pictures of classroom, labs to check the availability of adequate equipment's and tool to conduct the training and assessment
    - Pictures and videos of Assessment, training feedback and infrastructure.
- Apart from the Assessor, Technical assistant popularly known as Proctor also ensures the proper documentation and they verify each other's tasks.
- To validate their work on the day of assessment, regular calls and video calls are done.
- On-boarding and training of assessor and proctor is done on timely basis to ensure that 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 check on assessment quality and ensure assessment is carried out in fair and transparent manner
- Aadhar verification of candidates
- Evening Check (Post Assessment): Calls are made to the ground team to ensure event is over by what time and the documentation is done in proper manner or not.
- TP Calling: To keep check on malpractice activity, independent audit team calls to TP on recorded line to take confirmation if there was any malpractice activity observed in assessment on part of AA/SSC team. If calls are not connected, email is send to TP SPOC for taking their confirmation
- Video and Picture Evidence: Backend team collects video and pictures for assessment on real time basis and highlights any issue like, Students sitting idle/trainer allowed for helping out candidates during assessment.
- Surprise Visit: Time to time SSC/AA Audit team can visit the assessment location and do surprise audit for assessment process carried out by ground team.

- Geo Tagging: On day of assessment, each technical SPOC is required to login in our internal app which is Geo tagged. Any deviation with centre address needs to be highlighted to assessment team on real-time basis.

Method for assessment documentation, archiving, and Access:

- ASCI has fully automated result generation process in association with multiple AAs
- Theory, Practical and Viva marks forms the basis of the results and encrypted files generated to avoid data manipulation. All responses captured and stored in System with Time-Stamps at the end of AAs and SSC. NOS-wise and PC-wise scores can be generated.
- Maker Checker concept: 1 person prepares results and another audit result which is internally approved by AA at first and then gets vetted at the end of SSC
- All soft copy of documents is received from the on-ground tech team over mail. The same are downloaded by our internal backend team and saved in Repository. The repository consists of scheme wise folders. These scheme wise folders have 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 candidate shall be stored and available for review (retained for 5 years/ till conclusion of project or scheme)

References

Glossary

Term	Description
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
Key Learning	Key learning outcome is the statement of what a learner needs to know, understand and be able to do to achieve the terminal outcomes. Aset 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
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
AGR	Agriculture
NOS	National Occupational Standard (s)
NSQF	National Skills Qualifications Framework
OJT	On-the-job Training
QP	Qualifications Pack
PwD	People with Disability
PPE	Personal Protective Equipment