



# **CCEK – NSQF ALIGNED PROGRAM**

## **COURSE SYLLABUS**

### **FOR**

## **Soil & Water Testing Lab Analyst**

## CCEK - NATIONAL SKILL DEVELOPMENT TRAINING PROGRAM

### Soil & Water Testing Lab Analyst

CCEK – NSDC course package covers the following Qualification Packs and leads to the following NSDC certifications. The students who successfully completed the course programs are entitled to get NSDC certification after undergoing the assessment process of NSDC as per the rules and regulations stipulated by NSDC from time to time.

SL. NO.	QUALIFICATIONS PACK	QUALIFICATIONS PACK CODE	NSQF LEVEL
1	<p><b><u>Soil &amp; Water Testing Lab Analyst</u></b></p> <p><b>Brief Job Description:</b></p> <p>The individual is responsible for conducting soil and water test and interpreting the soil analysis results in relation to the soil fertility management. The person prepares the Soil and Water Health card illustrating the desired cropping pattern, soil amendments and integrated nutrient management, and water management to be undertaken. The individual is also responsible for determining the nutrient status of plants as well as organic manure or compost being utilized as organic source of nutrients.</p>	AGR/Q8103	5

**COURSE DETAILS**

**Soil & Water Testing Lab Analyst**

**EXAMINATION DETAILS**

COURSE NAME	COURSE CODE	ELIGIBILITY	DURATION
Soil & Water Testing Lab Analyst	G58	Bachelor Degree Preferably In Agriculture	280

SL. NO.	EXAM	EXAM CODE	MAXIMUM MARK	INTERNAL	TOTAL MARK
<b>THEORY PAPERS</b>					
1	Fundamentals of Soil Science	T001	100	50	150
<b>PRACTICAL PAPERS</b>					
1	Water Sample Collection and Preservation	L001	100	50	150
<b>TOTAL MARKS</b>					
1	Total Examination Marks (Theory Online + Practical Examination)				200
2	Total Internal Marks				100
3	<b>Total Marks (Total Internal Marks + Total Examination Marks )</b>				<b>300</b>

**Soil & Water Testing Lab Analyst**

**INTERNAL MARK CRITERIA FOR EACH**

SL NO.	MODULE	MODULE CODE	MAXIMUM MARK	INTERNAL MARK	TOTAL MARK
1	Fundamentals of Soil Science	T001	100	50	150
2	Water Sample Collection and Preservation	L001	100	50	150
	TOTAL		200	100	300

ATTENDANCE	GENERAL PERFORMANCE	INTERNAL EXAMINATIONS/ PROJECTS/ ASSIGNMENTS	TOTAL MARKS
5	5	40	50

# **COURSE SYLLABUS**

**FOR**

**Soil & Water Testing Lab Analyst**

<b>COURSE</b>	Soil & Water Testing Lab Analyst	
<b>TOTAL MARKS</b>	Mark: 300	Internal Mark: 100
<b>TOTAL HOURS</b>	280 Hrs	

**DEFENITION OF CREDIT**

1 Credit	15Hrs Theory/ 30Hrs Practical
Skill Components	60 – 70 % of Total Credit

**MODULES INCLUDED IN THIS SUBJECT**

<b>SL NO</b>	<b>MODULE NAME</b>	<b>CREDIT BREAKUP</b>
1	Module 1: Introduction to the role of a Soil & Water Testing Lab Analyst	<b>1</b>
2	Module 2: Hygiene and cleanliness	
3	Module 3: Lab Sanitation	
4	Module 4: Lab Safety	
5	Module 5: Physical Analysis of soil samples	
6	Module 6: Chemical Analysis of soil samples	
7	Module 7: Reclamation of problematic soils	
8	Module 8: Analysis of the plant nutrient composition	<b>1</b>
9	Module 9: Analysis of nutrient composition of manures/composts	<b>1</b>
10	Module 10: Analysis of the water sample	<b>1</b>
11	Module 11: Calculation of the amount of nutrients present/required in soil/water sample	<b>1</b>

12	Module 12: Preparation of the Soil and Water Health Card	<b>1</b>
13	Module 13: Supervision and Training of the Lab Assistant in good lab practices	<b>1</b>
14	Module 14: Soft Skills and Computer Skills	<b>1</b>
15	Module 15: On-the-Job Training	<b>1</b>
	Total	<b>9</b>

### **Training Outcomes**

- Identify the basic design and layout of the lab
- Practice personal hygiene and lab sanitation guidelines
- Follow safety guidelines at the lab
- Perform physical analysis of soil samples
- Perform chemical analysis of soil samples
- Comprehend the plant nutrient composition through analysis
- Analyze nutrient composition of manures/composts
- Identify the reclamation requirement of problematic soils
- Analyze the Water Sample
- Calculate the amount of nutrients present/required for the soil
- Prepare and upload the Soil and Water Health Card based on sample analysis
- Supervise the activities of the Lab Assistant
- Train the Lab Assistant in good lab practices

## **MODULES**

### **Module 1: Introduction to the role of a Soil & Water Testing Lab Analyst**

#### **THEORY**

- Describe different types of soil- properties, classification, texture, etc.
- Describe the water sources used for irrigation purpose
- Explain the importance of soil & water quality for enhancing the farm productivity
- Describe the basic analysis procedures to be undertaken in the Soil & Water Testing Lab.
- Explain the responsibilities and duties of a Soil & Water Testing Lab Analyst
- Explain the safety precautions to be taken for the use of chemicals and equipment used in lab.
- Explain the importance of manure and quality composition for field.
- Explain the roles and procedure of the equipments in the lab

#### **PRACTICAL**

- Identify different types of soils
- Identify chemicals/reagents required for conducting various soil physical and chemical tests.
- Identify the different types of manure and uses

### **Module 2: Hygiene and cleanliness**

#### **THEORY**

- 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.
- List the work instructions for maintaining the required lab environment
- Explain the importance of informing the designated authority on personal health issues related to injuries and infectious diseases.
- Explain basic emergency and first aid procedure
- Discuss the importance of Personal Protective Equipment
- Explain the good lab practices
- Explain the methods of lab cleaning and mopping
- Explain about waste management and methods of waste disposal

## PRACTICAL

- 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.
- Demonstrate segregation of waste

## **Module 3: Lab Sanitation**

### THEORY

- Describe the layout of the lab.
- Describe the requirements and working of different chambers like Soil Sample Process room, Soil Store room, Physical & Chemical analysis room, Instrument room.
- Explain the uses of equipment, tools, etc. and their placement in the lab.
- Describe the use of clean lab coat, gloves, face masks, goggles, etc.
- Explain the things which should be strictly avoided inside the lab such as eating, smoking & drinking.
- Explain the safety precautions to be undertaken before cleaning of the lab.
- Describe the cleaning techniques for the equipment in the lab.
- Describe the importance of segregating the waste as recyclable and non- recyclable.
- Describe different methods of disposing waste.
- Explain the impact of pollution on the environment and how recycling waste helps.
- Describe the environmental benefits of conserving electricity at the workplace.
- Discuss different chemicals, lab-wares, equipment and their use
- List the disinfectants and fumigants used in the lab

### PRACTICAL

- Sketch a rough layout of the lab with proper labels.
- Identify different tools and equipment used in the lab.
- Demonstrate the use of PPEs.
- Identify cleaning tools used for the rooms/equipment.
- Demonstrate the use of exhaust and fume hoods while using volatile compounds.
- Show how to check the expiry date of the chemicals.
- Classify different types of waste materials as recyclable and non- recyclable.
- Demonstrate how to dispose of hazardous waste with safety precautions.
- Show how to turn on and off the appliances and equipment in a proper manner.

## Module 4: Lab Safety

### THEORY

- List the PPE required at the workplace.
- Describe the common 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 hazard symbols / labels commonly used on the chemical bottles.
- Describe the methods of safe handling of chemicals.
- Describe the techniques to dispose of hazardous chemical/physical waste keeping in mind the safety of others present inside the lab.
- Describe the common first aid procedures to be followed in case of emergencies.
- State measures that can be taken to prevent accidents and damages 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.
- Explain the operation and maintenance of various equipment of the lab

### PRACTICAL

- Demonstrate the use of first aid kit and the materials present inside it and when to apply what.
- Demonstrate how to operate a fire extinguisher.
- Demonstrate the proper technique of pouring and mixing of chemicals/reagents and the chemistry behind reactions.
- Display the correct way of donning, doffing and discarding PPE such as face masks, hand gloves, face shields, PPE suits, etc.
- Show how to sanitize the tools, equipment and machinery properly.
- Demonstrate 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.
- Prepare a list of relevant hotline/ emergency numbers.

## Module 5: Physical Analysis of soil samples

### THEORY

- Explain different physical properties of soil.
- Describe the textural classification of soil through International Pipette method.
- Describe Soil moisture content, bulk density, Water Holding Capacity & Permanent Wilting Point, and their importance and different method of estimating them.
- Explain the Hydraulic Conductivity of soil and how to determine it through Constant Head method & Falling Head method.
- Explain the Soil Moisture Content by Gravimetric method and Infrared Moisture method.
- explain the nutrient composition in manure and methods to analyse it
- Explain nutrient deficiency symptoms in plants
- Explain how to handle the equipments during analysing the soil samples and to maintain it.

### PRACTICAL

- Determine the texture of soil through the International Pipette method.
- Determine the soil moisture content by Gravimetric and Infrared Moisture methods.
- Determine the Water Holding Capacity of soil at field capacity & Permanent Wilting Point through pressure plate.
- Determine the bulk density of soil through Weighing Bottle method, Clod method & Core method.
- Determine the hydraulic conductivity of soil through the Constant Head and Falling Head methods.
- Demonstrate the process of Gravimetric method and infrared moisture method

## Module 6: Chemical Analysis of soil samples

### THEORY

- Describe the method of preparing solutions of different strengths and conversion to molarity, molality and normality, and their standardization using a standard solution.
- Describe the process of calculating soil pH with use of litmus paper and pH meter.
- Describe the process of calculating soil EC through salt analysis.
- Explain the Walkley & Black Method and UV Spectrophotometer method to determine Organic Carbon in the soil sample.
- Explain the Alkaline Permanganate method and Kjeldahl method to find out Nitrogen present in the soil.
- Describe Acid Neutralization & Schrotus Apparatus method to calculate Calcium carbonate ( $\text{CaCO}_3$ ) in the soil sample.

- Describe Olsen's /Bray's Method to determine Phosphorus in the soil sample.
- Explain the importance of finding Potassium and Sodium through Flame Photometer.
- Explain the EDTA Titrimetric method of determining Calcium and Magnesium in the soil sample.
- Describe the Hot Water method to determine Boron.
- Describe the Precipitation method and Turbidimetric method to determine Sulphur.
- Explain DTPA method (Atomic Absorption Spectroscopy) to determine the amount of Zinc, Copper, Iron & Manganese.
- Describe the Cation Exchange Capacity of soil through Ammonium Saturation & Sodium Saturation method.
- Explain the importance and use of Mini-soil Kits for analysis of macro & micro-nutrients.

### PRACTICAL

- Demonstrate the preparation of different solutions and their standardization.
- Show how to do proper labelling of the solutions prepared.
- Demonstrate the use of litmus paper and pH meter to determine the pH of the sample soil.
- Demonstrate how to calculate EC of the soil through salt analysis.
- Demonstrate Walkley & Black method and use of UV Spectrophotometer to find out Organic Carbon in the soil sample.
- Demonstrate Alkaline Permanganate method and Kjeldahl method to calculate Nitrogen.
- Demonstrate Olsen's Method to determine Phosphorus.
- Demonstrate the Flame Photometer experiment to find out Potassium and Sodium
- Demonstrate the Acid Neutralization reaction and Schrotus Apparatus method to determine Calcium carbonate ( $\text{CaCO}_3$ ).
- Demonstrate EDTA Titrimetric method of determining Calcium & Magnesium.
- Demonstrate hot water method to determine boron
- Demonstrate the Precipitation method and Turbidimetric method to find out Sulphur quantity in soil sample.
- Demonstrate Atomic Absorption Spectroscopy or DTPA method to calculate Zinc, Copper, Iron & Manganese.
- Demonstrate Ammonium Saturation & Sodium Saturation method to determine Cation Exchange Capacity of the soil.
- Demonstrate the usage of Mini-soil kits for analyzing macro & micro-nutrients.

## **Module 7: Reclamation of problematic soils**

### **THEORY**

- Define Problematic soils, their types, location and reclamation measures.
- Describe various soil amendment measures to increase fertility and improve the physical and chemical attributes of the soil.
- Describe the importance of incorporating gypsum for the reclamation of alkali soil.
- Describe the importance of adding lime to acidic soils.
- Explain the remedial measures and management techniques for problematic soil

### **PRACTICAL**

- Determine gypsum requirement of the alkali soil for its reclamation.
- Determine the lime requirement of the acidic soil to rejuvenate them.
- Determine to reclamation of problematic soil in organic way

## **Module 8 : Analysis of the plant nutrient composition**

### **THEORY**

- Explain the theoretical basis of plant sample collection.
- Explain nutrient requirement for each crop.
- Describe the process of calculating total Nitrogen in the plant sample by Micro-Kjeldahl method.
- Describe the process of calculating total Phosphorus by using Ammonium Molybdate-Vanadate solution.
- Explain the method of determining total Potassium by Flame Photometer and calculating it on Oven Dry basis.
- Describe Standard Curve method to determine total Sulfur in the plant sample.
- Explain Atomic Absorption Spectroscopy to determine the amount of Zinc, Copper, Iron & Manganese.
- Describe the Azomethine H method to find out the amount of Boron in plants.

## PRACTICAL

- Demonstrate the process of collection of plant samples, washing with dilute acid and drying in the oven, grinding in electric motor, sieving and storing them properly away from chemical fumes.
- Determine total Nitrogen in the plant sample by acid digester followed by distillation in Micro-Kjeldahl method.
- Demonstrate how to perform di acid or HF digestion of plant samples for the total Phosphorus by using Ammonium Molybdate-Vanadate and prepare the standard curve and P standards.
- Determine total Potassium by using the di acid plant digest using Flame Photometer and calculating it on Oven Dry Basis.
- Determine total Sulfur in the plant sample using di acid plant digest and prepare the sulphur standard curve.
- Demonstrate how Atomic Absorption Spectroscopy works to determine the amount of Zinc, Copper, Iron & Manganese from di acid digest.
- Demonstrate Azomethine H method to determine the amount of Boron in plants.

## **Module 9 : Analysis of nutrient composition of manures/composts**

### THEORY

- Describe the importance of manure and compost for soil and plant health.
- Describe the method of calculating moisture content or dry matter in the manure/compost sample.
- Explain the method of determining total NPK.
- Describe the standard methods and processes to determine secondary nutrients (Ca, Mg, S).
- Describe the importance of micro- nutrients (Zn, Cu, Fe, Mn & B) and how they are assessed in a manure/compost sample.
- Explain the method of determining C: N ratio and the importance of these two elements in manure/compost.
- Describe the physical properties such as pH and EC for the given manure/compost sample.

### PRACTICAL

- Demonstrate the process of determining moisture content or dry matter in the sample for assessing the effectiveness of manure/compost.
- Determine the total NPK present in the sample.
- Demonstrate the standard methods of calculating secondary nutrients (Ca, Mg, S)
- Determine micro-nutrients (Zn, Cu, Fe, Mn & B) in the given sample.
- Determine the C: N ratio by appropriate method in the manure/compost samples.
- Determine pH and EC of the manure/compost sample.

## Module 10 : Analysis of the water sample

### THEORY

- Describe the process of determining pH of water through different methods.
- Explain the method of determination of EC of water with the help of EC Meter.
- Explain the significance of determining Total Dissolved Solids (TDS) in the water and how to calculate it.
- Explain the method of determining Total Suspended Solids (TSS) in the water sample.
- Explain the Water Hardness Index by calculating the amount of Carbonates & Bicarbonates.
- Explain the calculation of Calcium and Magnesium by EDTA method.
- Describe the determination of Sodium and Potassium amount present in the sample by Flame Photometer.
- Explain the calculation of Phosphorus in irrigation water through applicable methods.
- Describe the methods of calculating Nitrogen in the water samples.
- Explain the process of calculation of Boron in the irrigation water samples
- Explain the importance of finding out the types and amount of Chlorides present in the water sample and the methods through which it is done.
- Describe the importance and method of determining the types and amount of Sulphates present in the water sample.
- Explain the fundamentals of water testing
- Discuss the international atomic weights
- Discuss EC readings according to the temperature
- Explain good laboratory practices and avoid contamination of sample water
- Describe instrument settings for flame photometer and atomic absorption spectroscopy

### PRACTICAL

- Demonstrate the method of determination of pH of water.
- Determine the EC of water with the use of EC meter.
- Demonstrate the method of calculation of Total Dissolved Solids (TDS) in a water sample.
- Demonstrate the method of determination of Total Suspended Solids (TSS).
- Demonstrate the method of calculation of carbonate and bicarbonate in water sample.
- Assess the Water Hardness Index by calculating the quantity of Carbonates and Bicarbonates in the sample.
- Calculate and classify the Residual Sodium Bicarbonate.
- Demonstrate the EDTA method of determining Calcium and Magnesium.
- Demonstrate the method of determining Sodium and Potassium through Flame Photometer.
- Demonstrate the method of calculation of Phosphorus in the sample.
- Demonstrate the method of calculation of Nitrogen in the water sample.
- Assess the total amount of Boron in the water samples.

- Identify the types of Chlorides and the process of analysing them in water samples.
- Determine the types and amount of Sulphates present in the sample.
- Demonstrate instrument settings for flame photometer and atomic absorption spectroscopy

## **Module 11 : Calculation of the amount of nutrients present/required**

### **THEORY**

- Describe the formulae and methodology of calculating the quantity of nutrients present after conducting various chemical tests.
- Explain the interpretation of analysed data with the help of computer software, soil fertility charts, indexes, etc.
- Define the classification of soil test values of nutrients into low medium and high.
- Describe the basics of soil fertility management and how to recommend nutrient doses for enhancing it.
- Describe the importance of fertigation system and the nutrient formulations to be recommended for the same.
- Outline the precautions to be taken in fertigation using sparingly and insoluble fertilizers.

### **PRACTICAL**

- Calculate the amount of nutrients present in the sample.
- Demonstrate how to feed the data into necessary software or to interpret it using the charts and indexes, etc.
- Classify the soil test values of nutrients into low medium and high.
- Calculate the amount of nutrients and fertilizers required for soil fertility management for different crops.
- Demonstrate the techniques and practices to be followed for the soil fertility management.
- Demonstrate how to incorporate different formulations of fertilizers and nutrients in fertigation systems for better utilization of resources.

## **Module 12 : Preparation of the Soil and Water Health Card**

### **THEORY**

- Explain the recommendations to be provided in the Soil & Water Health Card post all the analysis which are precisely calibrated according to various parameters such as yield target, crop nutrient requirement, soil type, water hardness, etc.
- Define the criteria and parameters to be undertaken for making recommendations to enhance the quality of soil and increase the productivity.
- Explain the importance of using manures/compost and green crops as cover crops for increasing the quality of soil and increase the fertility.
- Describe the amendments such as gypsum, pyrite and lime for the reclamation of problematic soils.

- Explain the importance of Integrated Nutrient Management practices for better utilization of available resources and sustainable agriculture.
- Explain the process of uploading all the processed data which have been collected post analysis of the samples and its importance for future referencing.
- Describe the process and importance of uploading the Soil & Water health Card on the portal and the timely distribution of the same.
- Explain the utility of GIS and importance of creating a Soil Fertility Map for a location.
- Discuss the importance and information provided in the soil card
- Explain the Soil Health Management - concepts, goals and methods
- Explain the criteria of essential nutrients and deficiency symptoms of nutrients in plants

### **PRACTICAL**

- Demonstrate preparation of soil and water health cards based on the sample analysis
- Demonstrate how to incorporate amendments such as gypsum, pyrite and lime to reclaim the problematic soils.
- Demonstrate the model practices to be followed under Integrated Nutrient Management.
- Demonstrate how to feed the processed data on the online portal using a computer/mobile phone.
- Demonstrate how to upload a fully prepared Soil & Water Health Card on the portal using computer.
- Demonstrate the usage of GIS software to create a Soil Fertility Chart from the processed data.
- Practice to handle the data in computer
- Prepare irrigation schedule as per the land and crop requirement and water management
- Interpret soil analysis and specific land qualities for preparation of Soil Health card
- Interpret water analysis and specific water body qualities for preparation of Water Health card

## **Module 13 : Supervision and Training of the Lab Assistant in good lab practices**

### **THEORY**

- Describe the importance of overseeing of day to day lab activities.
- Explain the effective methods of sharing and seeking information and feedback at the workplace.
- Explain the procedure for completing work- related documentation.
- Describe the process of mentoring an assistant at the workplace.
- Describe the importance of guiding the assistant to follow safety and sanitation guidelines of the lab.
- Explain the ways of monitoring the data entry work being done by the assistant.

- Describe the methods and process of training the lab assistant to calibrate and optimize the equipment.
- Explain the importance of taking all the readings and observations post experiment, correctly and timely.
- Describe the ways to train the assistant in uploading data and Soil & Water Health Cards on the portal for future referencing.
- Explain the importance of maintaining a healthy work relationship with co-workers, customers and seniors.
- Explain how to assign work to lab assistant
- Explain good lab practices
- Discuss about safe lab operations Procedures
- Know the repair and Maintenance of the equipment's in the lab.

### **PRACTICAL**

- Demonstrate requisite level of proficiency in verbal and non- verbal communication at the workplace across the gender and person with disability
- Demonstrate the principles to be followed for training the lab assistant in good lab practices, maintaining a healthy work relationship with everyone, abiding by the rules & regulations of the lab, etc.
- Demonstrate different approaches of training an assistant at the workplace.
- Prepare a sample training schedule for an assistant.
- Demonstrate the use of different training aids for effective training.
- Demonstrate the method to prepare standard solution

## **Module 14 : Soft Skills and Computer Skills**

### **THEORY**

- Explain the importance of verbal and non- verbal communication at the workplace.
- Explain the importance of inclusion of all genders and People with Disability (PwD) at the workplace.
- Explain gender concepts (gender as a social construct, gender sensitivity, gender equality etc.), issues and applicable legislation.
- Define the need for appropriate verbal and non-verbal communication while interacting with all genders and PwD.
- Explain the applicable PwD related regulations.
- Discuss organization skills- decision making, team management, goal setting, multitasking, etc.
- Explain basic computer skills including data entry, photocopying, printing, record maintenance and other associated work in MS Office.
- List the different payment modes including UPI, e-wallets, etc
- Discuss personal strengths and value systems at work place for the business like safe work habits, achievement motivation, time management, anger management, stress management etc.

- Recall important tenets of digital literacy viz. fundamentals of computer terminology, parts of a computer and a keyboard, main applications of MS Office and related electronic system of data management and record keeping
- Discuss the essentials of matters pertaining to financials like saving money, bank accounts, types of costs, investment options, insurance products, taxes etc.
- Discuss how to prepare for employment and self-employment like preparing for an interview, effective resume writing, basic workplace terminology etc.
- Discuss the basics of entrepreneurship and identify new business opportunities viz effective leadership, effective speaking, effective listening, problem solving, business opportunities, types of entrepreneurs, entrepreneurial process and ecosystem, resilient entrepreneurs

### **PRACTICAL**

- Show how to do SWOT analysis of personal strengths and workplace required value systems
- Demonstrate requisite level of proficiency in verbal and non- verbal communication at the workplace.
- List the qualities of an effective leader and the benefits of effective leadership
- Demonstrate appropriate verbal and non-verbal communication that is respectful of genders and disability.
- Show how to use digital payment modes viz. NEFT, RTGS, UPI wallet, internet banking, etc.
- Demonstrate the parts, utility and importance of various electronic tools and equipment's necessary for lab operations
- Identify techniques of dealing effectively with failure
- Demonstrate use of various software for record keeping and data management

### **Module 15 : On-the-Job Training**

#### **THEORY & PRACTICAL**

- Demonstrate how to maintain personal hygiene and undertake sanitation and safety measures in the Lab
- Show how to perform physical and chemical analysis of soil, plants and manures/compost sample
- Demonstrate how to test and analyze water sample
- Demonstrate preparation, upload and distribution of the Soil and Water Health Card
- Show how to supervise Lab Assistant and communicate effectively at workplace
- Demonstrate necessary digital skills for the lab operations