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# Competency Based Curriculum

For Classes 9 to 12 (NSQF Levels 1 to 4)

**Course: Agriculture**

**(Job Role: Micro Irrigation Technician)**

Developed by

**Prof. (Dr.) Asfa M. Yasin**

Professor, Department of Agriculture and Animal Husbandry

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NCERT

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For Classes 9 to 12; NSQF Levels 1 to 4

**Course: Agriculture**  
(Job Role: Micro Irrigation Technician)

DEVELOPED BY

Prof. (Dr.) Asfa M. Yasin  
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Shyamla Hills, Bhopal - 462 013, India

## COMPETENCY BASED CURRICULUM

**Agriculture (Job Role: Micro Irrigation Technician)**  
For Classes 9<sup>th</sup> to 12<sup>th</sup>; NSQF Levels 1 to 4

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## PREFACE

Ministry of Human Resource Development, Government of India developed the National Skill Qualification Framework (NSQF) to introduce vocational courses from class 9th onwards. The NSQF organizes qualifications according to a series of levels of knowledge and skills. These levels are defined in terms of learning outcomes i.e., the competencies (knowledge, skills and attitude) which the learners must possess regardless of whether they were acquired through formal, non-formal or informal education and training system. Qualifications are made up of occupational standards for specific areas of learning units or unit of competency. Units of competency are the specification of knowledge and skill and the application of that knowledge and skill to the standard of performance expected in the workplace. The unit of competency or National Occupation Standards comprising generic and technical competencies an employee should possess are laid down by the Sector Skill Council of the respective economic or social sector.

Competency is defined in terms of what a person is required to do (performance), under what conditions it is done (conditions) and how well it is to be done (standards). It can be broadly categorized into foundational, practical and reflexive competencies. Generic competencies are considered essential for a person to participate effectively in the workforce, whereas technical competencies are an individual's knowledge and expertise in the specific group task and its processes and its rules and regulations. An executive order F.No.1-4/2011-VE dated 3 Sept., 2012 on the various aspects of NVEQF has been issued by the MHRD. For more details on the NVEQF, please visit the website of MHRD at [www.mhrd.gov.in](http://www.mhrd.gov.in)

The competency based curriculum is broken down into coherent parts known as Units. Each unit is further broken down into knowledge and skills on the basis of which evidence is to be provided by the learner and the evaluation is to be done by the teacher or trainer.

PSSCIVE which is part of NCERT New Delhi is mandated by Government of India as an apex R&D Institute for Vocational Education. The institute has taken up development of curriculum and courseware for classes 9th to 12th to introduce vocational courses in secondary and senior secondary schools in of the country.

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## 1. About the Course

Agriculture is the cultivation of plants, fungi, and other life forms for food, fiber, medicinal and other products used to sustain and enhance human life. It also includes livestock production which provides milk and meat products, fibers and other raw materials. The major agricultural products can be broadly grouped into foods, fibers, fuels, meat, spices and raw materials. Fibers include cotton, wool, hemp, silk and flax. Agriculture and allied sectors, like forestry and fisheries in India accounted for 13.7% of the GDP (Gross Domestic Product) in 2013. India is the world's largest producer of many fresh fruits and vegetables, milk, major spices fresh meat, fibrous crops, such as jute. India is the second largest producer of wheat and rice, the world's major food staples.

Over one third of the world's workers are employed in agriculture, second only to the service sector. In India agriculture employs about 50% of the total workforce.

The Ministry of Agriculture is the main authority in India for regulation and development of activities relating to agriculture, horticulture, fishing, animal husbandry, etc. It is implementing various schemes and policies for the sector through its various departments and institutions, including Department of Agriculture and Cooperation and Department of Animal Husbandry, Dairying and Fisheries. The Ministry of Food Processing Industries is actively engaged in promotion of entrepreneurial activities in the segments of fruits and vegetables processing, fish processing, mushroom processing, honey processing, etc. Besides, commodity boards, like tea board, coffee board, rubber board, medicinal plants board, etc. have been set up to boost the growth of the sectors like tea, coffee, rubber, medicinal plants, respectively.

There exists innumerable business opportunities in the agriculture and allied sectors. Education and training in agriculture meet the requirements of industries that employ educated personnel and also prepare people for undertaking farming and allied activities. Higher education in agriculture is required for meeting the needs of human resource needed for conducting research, teaching and training. Introduction of vocational courses in agriculture is seen as a strategy to create educated and productive workforce who will employ scientific methods for promoting sustainable agriculture.

It is with this view the Govt. of India has brought this neglected sector under the umbrella of National Skill Development Mission. The constitution of Agriculture Skill Council of India (ASCI) under the National Skill Development Corporation (NSDC) is a step forward for skill development initiative through formal and non-formal system of education and training under NSQF and STAR/ Ajeevika schemes respectively. Consequently, job roles have been identified and National Occupational Standards have been developed by ASCI in prominent agriculture areas where there is demand for skilled human resource and/ or job opportunities for self and wage employment.

It is encouraging to note that many states are coming forward to offer agriculture based vocational courses in secondary and senior secondary classes under NSQF as per job roles identified by ASCI. There is a need to develop curricula for these job roles. In school system under NSQF this curriculum has been developed for L1 to L4 to develop competencies and skills required for performing job role of Micro Irrigation Worker.



## 2. Objectives of the Course

Upon completion of this course, you will be able to:

1. Describe the importance of agriculture in our lives and Indian economy
2. Demonstrate the knowledge of processes and preparations involved in the basic agricultural practices for production of different crops in different seasons
3. Demonstrate the knowledge of basic animal husbandry practices for production of milk, fishes and shrimp, poultry birds, honey, etc
4. Demonstrate the knowledge of field operations in production and marketing of paddy
5. Communicate effectively at workplace
6. Demonstrate the knowledge of safe handling of equipment and chemicals
7. Demonstrate the knowledge of occupational health and safety measures
8. To study different methods of irrigation used in crop production
9. Identify different types of sprinklers, their components and their use in different crops
10. Understand field layout of different types of sprinkler systems
11. Study the design, operate drip irrigation system in different crops as per suitability
12. Acquaint with functions of different components of drip irrigation system
13. Acquaint with the installation and layout of drip irrigation system
14. Understand the importance of fertigation in crop production

### 3. Course Structure

#### NSQF Level-1 (Class 9)

Sl. No.	Unit Code	Unit Title	No. of Notional Learning Hours
1.	AG101-NQ2014	Introduction to Agriculture	20
2.	AG102-NQ2014	Introduction to Soil Management	20
3.	AG103-NQ2014	Introduction to Field Preparation and Planting	20
4.	AG104-NQ2014	Communication at Workplace	20
5.	AG105-NQ2014	Introduction to Agricultural Crops	20
6.	AG106-NQ2014	Introduction to Animal Husbandry	20
7.	AG107-NQ2014	Introduction to Occupational Safety and Appropriate Technology	15
8.	AG108-NQ2014	Marketing of Agriculture Produce	15
<b>Total</b>			<b>150</b>

Successful completion of **150 hours** of theory sessions and **50 hrs** of practical activities and on-the-job learning is to be done for full qualification.

#### NSQF Level-2 (Class 10)

Sl. No.	Unit Code	Unit Title	No. of Notional Learning Hours
1	AG201-NQ2014	Applied Agricultural Practices	25
2	AG202-NQ2014	Introduction to Quality of Seeds and Seed Treatment	25
3	AG203-NQ2014	Introduction to Integrated Pest Management	25
4	AG204-NQ2014	Introduction to Micro-irrigation Practices	25
5	AG205-NQ2014	Introduction to Animal Husbandry Practices - Handling, Housing and Feeding	25
6	AG206-NQ2014	Introduction to Animal Husbandry Practices - Disease Management	25
<b>Total</b>			<b>150</b>

Successful completion of **150 hours** of theory sessions and **50 hrs** of practical activities and on-the-job learning is to be done for full qualification.

#### NSQF Level-3 (Class 11)

Sl. No.	Unit Code	Unit Title	No. of Notional Learning Hours
1	AG301-NQ2014	Introduction to Micro-irrigation	10
2	AG302-NQ2014	Inventory of resources and condition for sprinkler irrigation	20
3	AG303-NQ2014	Classification of types and classification based on portability of sprinkler irrigation	20
4	AG304-NQ2014	Components of sprinkler irrigation system	20
5	AG305-NQ2014	Design of sprinkler irrigation system	20
6	AG306-NQ2014	Installation, layout and evaluation of uniformity	20

		coefficient of sprinkler irrigation important considerations	
7	AG307-NQ2014	Maintenance of sprinkler irrigation system	20
8	AG308-NQ2014	Communication Skills at Workplace	20
<b>Total</b>			<b>150</b>

Successful completion of 150 hours of theory sessions and 50 hrs of practical activities and on-the-job learning is to be done for full qualification.

#### NSQF Level-4 (Class 12)

Sl. No.	Unit Code	Unit Title	No. of Notional Learning Hours
1	AG401-NQ2014	Drip irrigation	20
2	AG402-NQ2014	General information required for the installation of drip irrigation system	20
3	AG403-NQ2014	Components of drip irrigation system	25
4	AG404-NQ2014	Design of drip irrigation system	25
5	AG405-NQ2014	Installation and layout of drip irrigation system	30
6	AG406-NQ2014	Fertigation	15
7	AG407-NQ2014	Maintenance of drip irrigation system	15
<b>Total</b>			<b>150</b>

Successful completion of 150 hours of theory sessions and 50 hrs of practical activities and on-the-job learning is to be done for full qualification

## 4. Classroom Activities

Classroom activities are an integral part of this programme and interactive lecture sessions, followed by discussions should be conducted by teachers. A variety of instructional strategies should be used by teachers to ensure learning of students. Teachers should make lesson plan topic wise along with different strategies to be used in the class room /laboratory/workshop. The class room activities may include use of multi-media packages, preparation of charts and posters and organising group discussion sessions targeted to problem solving, innovative ideas in handling the job role, developing communication and entrepreneurial skills etc. To understand importance of Agriculture as profession, the class based activities may include:

- i. Preparation of charts, collages, posters depicting economic importance of different crops viz. food grain, oil seed, cash crops, pulses, etc.
- ii. Charts for different seasons and parts of India with respect to crops prominently grown there
- iii. Group discussions on agriculture related topics and to focus on GDP, export of agriculture produce and understanding of patents and value added agri-products
- iv. Video films on agriculture practices undertaken in India and abroad with special focus on Storage of breeder seed and food grains in ware houses with understanding of pests and disease control

## 5. Practical Activities

Activities that provide practical experience in clinical set up would include hands on training on mannequins, simulated clinical set up, case based problems, role play, games, etc. on various clinical incidents and practical exercises in skill lab. Equipment and supplies should be provided to enhance hands-on experiences for students. Trained personnel should teach specialized techniques. A training plan signed by teacher that reflects equipment, skills and tasks should be prepared for training of the students in the organization/industry. The course may involve following practical activities:

1. Acquaintance with components of drip irrigation system (listed in the unit) and layout in the field with respect to plant spacing for drip irrigation.
2. Cleaning of laterals and emitters, understand clogging and de-clogging at the agriculture firm.
3. Collection and identification of different types of soils.
4. Demonstration by video, charts, posters of farm activities such as nursery bed preparation, field preparation, seed sowing, manuring, irrigation techniques, harrowing, de-weeding, etc.
5. Design and layout of agriculture field for few common crops by students
6. Developing understanding of fertigation in drip irrigation system by making observation on fertigation injector, fertilizer tank, venturi pump etc.
7. Familiarisation with types of soil and their relation to growing specific crops, methods of collection of soil samples, soil testing, farm inputs viz. seeds, fertilizers, manures, pesticides, farm implements, equipment, tools, etc.
8. Field visits to show farm operations to students about cultural practices being adopted by the farmers and which are helpful in reducing the pest incidence.
9. Identification and drawings of implements used in field preparation and sowing by ploughs, harrow, cultivators, levelers seed drill.
10. Identification of different organic manures and inorganic fertilizers.
11. Organisation of pre-planned FGDs on problems related to agriculture produce and its supply system
12. Preparation and use of crop calendars
13. Preparation of herbarium of crop plants, leaves, flowers and seed samples of major field crops.
14. Project and case studies of agriculture importance in Indian economy.
15. Survey for understanding marketing chains of agri-produce, demand and supply system
16. Survey/ case study: record of farm inputs and output to calculate economics of local specific crops
17. To draw in a chart the layout of sprinkler irrigation system.
18. To draw sprinkler irrigation system along with components.
19. To prepare chart/poster depicting layout of drip irrigation system in the agriculture field.
20. Under strict supervision of a trained person and following safety measures, solutions of pesticides can be prepared through live demonstration.
21. Visit to Agriculture farms to record observation on the operation and functioning of drip irrigation system for specific crops.
22. Visit to agriculture farms to record observations on irrigation methods used for different crops, observation on layout and components of sprinkler irrigation system as given in the unit.

## 6. On-the-Job Training

On-the-job training (OJT) occurs whenever more experienced employee or supervisor teaches less experienced person on how to do one or more tasks of a job. The training utilizes actual equipment and materials. OJT should be undertaken in a structured manner with a training plan under the supervision of an experienced trainer or supervisor. A training plan that reflects tasks to be performed and competencies to be imparted should be prepared and signed by the student, teacher, and supervisor at the workplace for training of the students in the organization/industry. The job role i.e. understanding basics of agriculture, crop production practices and management related tasks to be undertaken at the work place during OJT may include:

1. Nursery bed preparation
2. Collection methods of soil samples for soil analysis
3. Sowing methods and germination test
4. Lay out of field
5. Seed bed preparation
6. Soil analysis for pH, EC and NPK
7. Preparation of vermi-compost, green manure
8. Handling implements used in seed sowing, inter-culture operations, irrigation, weed control and pest management, manuring and application of fertilizers.
9. Imparting preliminary knowledge of handling and maintenance of pesticide application equipments, the interested students may develop efficiency in repair and maintenance of pesticides application equipments.
10. Preparation of field for layout of sprinkler irrigation system
11. Assistance in the installation of sprinkler irrigation system
12. Operating control valve to maintain the proper pressure and discharge in the system
13. Operation of fertilizer injector under supervision
14. Cleaning of laterals/ nozzles
15. Proper fitting of couplers
16. Maintenance of leakage of water in main/ sub-main and nozzles
17. Preparation of field layout for drip irrigation system
18. Acquaintance and assistance in the installation and fitting of the system
19. Operation of pump under supervision
20. Operating the system for maintaining the proper pressure in the system which is a basic need
21. Operating of fertilizer application
22. Cleaning of screen filter
23. Cleaning of laterals
24. Cleaning of drippers/ emitters clogged due to dust particles
25. Cleaning of emitters clogged due to calcium, magnesium precipitation through acid treatment
26. Cleaning of emitters/laterals clogged due to algae & bacterial growth through chlorination treatment
27. Maintenance of leakage of lateral and / or sub-main.

The trainer should break down all the steps of the job and train the students as per the training plan. In a structured OJT, the following steps should be followed:

Step 1: The Instructor or the trainer tell, show, demonstrate, and explain. The trainer gives an overview of the task while explaining the constructional details and use of the tools, equipment, materials, etc. in performing the tasks.

Step 2: The Instructor or the trainer demonstrates each step in detail, actually doing the steps of the task and explaining each step, one at a time, while the trainee watches. The steps may not necessarily be demonstrated in the sequence of actual operation, as sometimes it is better that simple tasks are demonstrated first to build confidence. Showing finished products at each appropriate step will help the learner understand what is required as outcome. While demonstrating, the trainer explains why each step is done in the way it is done.

Step 3: It involves direct trainee participation. The trainer monitors the progress on a checklist of competencies and offers feedback and pointers where and when needed.

Step 4: The trainee practices with clearly defined targets for performance standards.

## 7. Certification

Upon successful completion of this course the State Education Board and the Agriculture Sector Skill Council (ASCI) will provide a certificate to the student verifying the competencies acquired by the candidate. For more details about ASCI visit the website at <http://www.asci-india.com>.

## 8. Units

### NSQF Level-1 (Class 9)

Unit Code: AG101-NQ2014			
Unit 1 Title: Introduction to Agriculture (Duration: 20 hours)			
Location : Classroom and Agricultural Field			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Describe the importance of agriculture in Indian economy	<ol style="list-style-type: none"> <li>Describe the importance of agriculture(e.g. subsistence farming, organic farming, large scale farming and commercial farming) as a source of livelihood and increasing agricultural production</li> <li>Describe the share of agriculture in national income</li> <li>Describe the contribution of agriculture in employment</li> <li>Explain how agricultural products serve as a source for Industrial development (products may include but not limited to cotton, wool, sugar, jute, rice, wheat, etc.)</li> </ol>	<ol style="list-style-type: none"> <li>List the various agricultural products that promote industry and contributes to the growth of Indian economy</li> <li>Identify the factors influencing agriculture (factors may include but not limited to weather, agriculture inputs, diseases, pests, etc.)</li> </ol>	<p><b>Interactive lecture:</b> Role of Agriculture in Indian Economy</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Discussion sessions on the agricultural revolutions (green, yellow, white, blue, gray, golden, etc.) and how these revolutions affected the livelihood and employment opportunities.</li> <li>Discussion sessions on contributions of Agriculture in Indian economy.</li> <li>Ask students to prepare posters of various agricultural</li> </ul>

			products which are used for industrial productions and their contribution to the industrial growth.
Map the States according to their contributions in production of major crops of India (Wheat, Rice, Soyabean, Gram, Sugarcane and Cotton)	<ol style="list-style-type: none"> <li>Describe the chief characteristics of major crops</li> <li>Enlist States with major contribution to the cultivation of the following crops: <ul style="list-style-type: none"> <li><b>Wheat:</b> Punjab, Haryana, Uttar Pradesh</li> <li><b>Rice:</b> West Bengal, Chhattisgarh, Tamil Nadu</li> <li><b>Soybean:</b> Madhya Pradesh, Maharashtra, Rajasthan</li> <li><b>Gram:</b> Madhya Pradesh, Rajasthan, Uttar Pradesh</li> <li><b>Sugarcane:</b> Uttar Pradesh, Maharashtra, Tamil Nadu</li> <li><b>Cotton:</b> Gujarat, Andhra Pradesh, Maharashtra</li> </ul> </li> </ol>	<ol style="list-style-type: none"> <li>Identify the different crops by seed/plant samples</li> <li>Map the crops with the States making major contribution in their cultivation.</li> </ol>	<p><b>Interactive lecture:</b> Major Food, Oilseed and Cash crops and contribution of States in Large Scale Production</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Field visits for identification of major food grain crops, oilseed crops and cash crops</li> <li>Spot identification</li> <li>Discuss the agriculture map of the States. (available on <a href="http://www.mapsofindia.com">http://www.mapsofindia.com</a>)</li> </ul>

<b>Unit Code: AG102-NQ2014</b>			
<b>Unit 2 Title: Introduction to Soil Management (Duration: 20 hours)</b>			
<b>Location : Classroom, Soil Testing Laboratory and Agricultural Field</b>			
<b>Learning Outcome</b>	<b>Knowledge Evaluation</b>	<b>Performance Evaluation</b>	<b>Teaching and Training Method</b>
Demonstrate the knowledge of the components of soil and factors affecting soil fertility	<ol style="list-style-type: none"> <li>Describe the importance of soil and nutrients as primary, secondary and micro - e.g. soil as a medium of plant growth</li> <li>Describe the factors affecting soil formation and fertility</li> <li>Describe the composition of soil</li> <li>Describe the physical properties of soil (texture, structure, density, porosity, colour, consistency, etc.)</li> <li>Describe the chemical properties of soil (pH, salinity, cation exchange capacity, C:N ratio)</li> </ol>	<ol style="list-style-type: none"> <li>Identify different type of alluvium soils viz., loam, clay loam, and sandy</li> <li>Enlist various nutrients</li> <li>Demonstrate the knowledge of soil properties and their role in growth of plants</li> <li>Demonstrate the knowledge of soil textural classes - sand, silt, clay &amp; loam</li> </ol>	<p><b>Interactive lecture:</b> Properties of Soil and factors affecting Soil Fertility</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Study of equipment used for soil sampling and testing</li> <li>Collection of soil samples for soil testing</li> <li>Determination of soil texture by feel method</li> <li>Demonstration of determination of soil pH</li> <li>Discussion on soil test report and fertilizer recommendations</li> <li>Identification of different types of soils</li> </ul>

	<p>6. Differentiate between different types of soil (soils may include but not limited to alluvium, black, red, laterite, desert, mountain, saline, alkaline, peaty, marshy, etc.)</p> <p>7. Describe the method for collection of soil sample for soil testing</p>		
Identify the fertilizers used in agriculture crop production	<p>1. Describe the chief characteristics of the following fertilizers</p> <ul style="list-style-type: none"> <li>• Nitrogen fertilizers</li> <li>• Phosphatic fertilizers</li> <li>• Potassic fertilizers</li> <li>• Complete fertilizers</li> <li>• Slow release or time release fertilizers</li> <li>• Mixed complex</li> <li>• Bio-fertilizers</li> <li>• Manure</li> </ul> <p>2. Describe advantages and limitations of chemical fertilizers</p> <p>3. Describe advantages and limitations of bio-fertilizers</p> <p>4. Describe the general deficiency symptoms of N, K, P, Mn, Zn, etc.</p>	<p>1. Identify the different types of chemical and biological fertilizers, including but not limited to the following:</p> <ul style="list-style-type: none"> <li>• Nitrogen fertilizers</li> <li>• Phosphatic fertilizers</li> <li>• Potassic fertilizers</li> <li>• Mixed complex</li> <li>• Rhizobium fertilizers</li> <li>• Arbuscular mycorrhiza</li> <li>• Azolla</li> <li>• Anabaena</li> <li>• Blue-green algae</li> </ul> <p>2. List the mobile and volatile forms of nitrogen ions.</p>	<p><b>Interactive lecture:</b> Chemical and Bio-fertilizers</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Identification of various types of chemical and biological fertilizers in laboratory and field</li> <li>• Read the label on the packets of fertilizers and discuss the various aspects, such as ratio of N:P:K, purity and utility for the different crops, etc.</li> </ul>
Demonstrate the knowledge of different methods of fertilizer application	<p>1. Describe the different methods of fertilizer application (broadcasting, basal application, row/band placement, foliar application, side dressing, fertigation)</p> <p>2. Describe advantages and limitations of various methods of fertilizer application</p>	<p>1. Identify the different methods of fertilizer application through diagram, charts, and field demonstration.</p>	<p><b>Interactive lecture:</b> Methods of Fertilizer Application</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Field visit to study the nutritional disorders and symptoms in various crops due to N,P,Zn deficiency</li> <li>• Demonstration of various methods of application of chemical and bio-fertilizers in nursery and field</li> </ul>
Demonstrate the knowledge of various methods of irrigation	<p>1. Describe the different sources of irrigation (well, tube-well, canal, tank, etc.)</p> <p>2. Describe different</p>	<p>1. Identification of methods of irrigation through charts, diagrams, models, and field</p>	<p><b>Interactive lecture:</b> Methods of Irrigation</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Discussion on charts, models</li> </ul>



	<p>methods of irrigation (surface, sub-surface, flood, sprinklers, micro-sprinklers, drip or trickle)</p> <p>3. Describe the factors that affect the choice of irrigation method (quantity or volume, frequency, cost, etc.)</p> <p>4. Classify soil water - hygroscopic, capillary and gravitational water</p> <p>5. Describe the use of watering cans, pitcher cans, perforated plastic sleeves and other indigenous methods of irrigation</p>	<p>demonstration</p> <p>2. Demonstrate the knowledge of choosing the appropriate irrigation method for a crop</p>	<p>and diagrams of methods of irrigation and selection of irrigation method for different crops</p> <ul style="list-style-type: none"> <li>Field visit to study the various methods of irrigation, especially the micro-irrigation techniques and techniques for conserving water</li> </ul>
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Unit Code : AG103-NQ2014 Unit 3 Title : Introduction to Field Preparation and Planting (Duration: 20hours) Location : Classroom, Agro-meteorology Laboratory, Agriculture Field			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Demonstrate the knowledge of the role and importance of weather instruments and forecasting in agriculture	<p>1. Describe the various weather parameters that affect the growth and development of agricultural crops - temperature, moisture, rainfall, wind, etc.</p> <p>2. Describe the use of various instruments and equipment used for weather forecasting - thermometer, soil thermometer, wind vane, anemometer, rain guage, sling psychrometer, barometer, etc.</p>	<p>1. Demonstrate the knowledge of applications of various weather forecasting instruments and equipment</p>	<p><b>Interactive lecture:</b> Agro-meteorology</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Visit to a agro-meteorology observatory to study weather instruments and forecasting methods.</li> <li>Measurement of maximum and minimum air temperature</li> <li>Measurement of soil temperature</li> <li>Measurement of wind speed and direction</li> <li>Measurement of rainfall</li> </ul>
Demonstrate the knowledge of field and seedbed preparation	<p>1. Describe the factors that need to be considered while selecting method for field/seed bed preparation</p> <p>2. Describe the factors affecting seed</p>	<p>1. Identify the implements/equipment used for field preparation</p> <p>2. Demonstrate the use of some basic implements and equipment used in</p>	<p><b>Interactive lecture:</b> Field Preparation</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Identification of implements/equipment (may include but not limited to spade, indigenous plough,</li> </ul>

	<p>germination and emergence</p> <p>3. Differentiate between conventional method of cultivation, minimum tillage and direct drilling.</p> <p>4. Describe the procedure adopted for field preparation (ploughing, puddling, leveling, harrowing)</p> <p>5. Differentiate between shallow and deep ploughing</p> <p>6. Describe summer ploughing</p> <p>7. Describe the purpose of puddling, leveling and harrowing</p>	<p>field preparation</p> <p>3. Demonstrate basic practices for field preparation.</p>	<p>mould board plough, chisel plough, disc harrow, blade harrow, ridger, cultivators, levelers)</p>
<p>Demonstrate the knowledge of sowing/planting methods</p>	<p>1. Describe the types of sowing (hand sowing or open field)</p> <p>2. Describe the various methods of sowing (broadcasting, drilling, dibbling, etc.)</p> <p>3. Describe the procedure for pre-treatment of seeds before sowing (e.g. seed soaking, seed scarification)</p>	<p>1. Demonstrate the knowledge of the following:</p> <p>a. Hand sowing (flat sowing, ridge sowing and wide bed sowing)</p> <p>b. Open field planting</p> <p>2. Demonstrate seed soaking</p> <p>3. Demonstrate sowing of seeds in nursery beds/pots</p>	<p><b>Interactive lecture:</b> Sowing and Planting Methods</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Visit to the field to perform pre-seed treatment and practice various methods of sowing and planting</li> <li>• Sow seeds in pots/nursery beds</li> </ul>

<p><b>Unit Code : AG104-NQ2012</b></p> <p><b>Unit 4 Title : Communication at Workplace (Duration: 20 hours)</b></p> <p><b>Location : Classroom and Field</b></p>			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
<p>1. Understands meaning, concept and importance of communication skills at workplace</p> <p>2. Know</p>	<p>1. What is communication and its importance at workplace?</p> <p>2. What are the different types of communication skills including value based</p>	<p>1. Explain communication</p> <p>2. What do you understand about communication and its importance at workplace</p> <p>3. Write different types of communication skills</p> <p>4. Enlist four linguistic</p>	<p>1. Organising video and interactive sessions on communication and technological skills required at workplace</p> <p>2. Showing video shots specially taken for communication at agriculture field during various field operations e.g.</p>

<p>different types of skills required at workplace</p> <p>3. Understand and respond written communication</p> <p>4. Acquired all four linguistic skills i.e. writing, speaking, listening and reading skills in relation to the job role</p> <p>5. Effectively communicate at workplace with supervisors and field staff including unskilled labour force</p> <p>6. Handle job related technological skills in relation to communication</p>	<p>communication and entrepreneurial skills i.e. listening to all members of the team, empathy, patience, clarity in instructions, positivity, use of respectful language (oral skills) and ability to resolve conflicts amongst team members at workplace</p> <p>3. What technological skills are required at workplace and how to develop these in trainees?</p> <p>4. What methods are used to develop effective communication skills in trainees required at workplace?</p>	<p>skills required for communication with example of each one related to the job role</p> <p>5. Effective communication at workplace i.e. agriculture field, dairy farm, shrimp hatchery, etc.</p>	<p>nursery bed preparation, transplantation and seed sowing, spraying of chemicals, application of fertilizers and manure, harrowing etc. where instructions to field staff are involved.</p> <p>3. Practice sessions on writing, listening, reading and speaking skills for correct pronunciation of different implements, equipment, chemicals, crops, seeds and variety names in Hindi, English or common local specific names</p> <p>4. This practice is required for clear instructions to us and semi-skilled workers at the field during farm operations</p>
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Unit Code : AG105-NQ2014

Unit 5 Title: Introduction to Agricultural Crops (Duration: 20 hours)

Location : Classroom, Plant Breeding Research Centre, Tissue Culture Laboratory Agricultural Farm, Polyhouse

Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
<p>Name the important food crops, oil seed crops and cash crops grown in Kharif, Rabi and Zaid season</p>	<p>1. Describe the sowing and harvesting season for the following:</p> <ul style="list-style-type: none"> <li>• Kharif (e.g. Sowing - May to July and Harvesting - September to October)</li> </ul>	<p>1. Enlist the food crops, oil seed crops, and cash crops according to the season in which they are grown</p>	<p><b>Interactive lecture:</b> Classification of Crops according to Season</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Identification of seeds of field crops</li> <li>• Identification of field crops in agriculture farm/field</li> </ul>

	<ul style="list-style-type: none"> <li>• Rabi</li> <li>• Zaid</li> </ul> <p>2. Classify major agricultural crops according to the season</p>		
Describe the different fibre crops used for cultivation in India	1. Describe the chief characteristics of fibre crops grown in India and their uses (cotton, jute, sun-hemp, linseed, patsan)	1. Identification of different fibers and fibre crops viz. cotton, jute, sun-hemp, linseed, etc.	<p><b>Interactive lecture:</b> Fibre Crops</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Draw charts showing fibre crops and their uses</li> <li>• Visit to agricultural farm to study the characteristics of fibre crops</li> </ul>
Describe the different fodder crops (season wise)	1. Describe the characteristics of fodder crops- chari (sorghum), berseem (clove), oat, cluster-bean, lobia, lucerne, sudangrass	1. Identify different fodder crops- chari (sorghum), berseem, lobia, lucern, etc.	<p><b>Interactive lecture:</b> Fodder Crops</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Draw charts showing fodder crops and their uses</li> <li>• Spot identification of different fodder crops</li> </ul>
Demonstrate the knowledge of methods used for crop improvement	<p>1. Describe the factors which affect crop yields and seed quality</p> <p>2. Describe the various methods used for crop improvement (methods may include, but not limited to tissue culture, hybrids, transgenic varieties)</p>	<p>1. Enlist common varieties of major crops which have been developed using hybridization</p> <p>2. Describe at least 3 varieties of major crops</p>	<p><b>Interactive lecture:</b> Crop Improvement</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Visit to Plant Breeding Research Centre/Tissue culture laboratory to study the various methods used for crop improvement</li> <li>• Prepare charts of pictures displaying various methods of crop improvement</li> </ul>

Unit Code : AG106-NQ2014			
Unit 6 Title: Introduction to Animal Husbandry (Duration: 20hours)			
Location: Classroom, Dairy Farm/ Sheep Farm/Goat Farm/Piggery Farm/ Poultry Farm/Fish Farm			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Describe the importance of livestock	<ol style="list-style-type: none"> <li>1. Describe how livestock contribute to the livelihood of people in India</li> <li>2. Describe the contribution of livestock to the share of agriculture in national income</li> <li>3. Describe the various terms used in animal husbandry</li> <li>4. Explain how livestock products serve as a source of industrial development (e.g. milk, ghee, khoya, butter, etc.)</li> </ol>	<ol style="list-style-type: none"> <li>1. Enlist animals included in livestock</li> <li>2. Identify various species of livestock</li> <li>3. Relate utility of animal husbandry to national economy of India</li> <li>4. Enumerate uses of livestock</li> </ol>	<p><b>Interactive lecture:</b> Livestock Production</p> <p><b>Activity:</b> Discussion on the contributions of livestock in growth and development of Indian economy.</p>
Identify breeds of livestock like Cow, Buffalo, Sheep, Goat, Pig	<ol style="list-style-type: none"> <li>1. Enlist breeds of livestock</li> <li>2. Describe the body parts of cattle, sheep, camel, yak, pig, goat, poultry, etc.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify body parts of cattle, sheep, goat, hen, camel, yak, pig, etc.</li> <li>2. Identify breeds of different animals</li> <li>3. Differentiate breeds of animals according to their utility</li> </ol>	<p><b>Interactive lecture:</b> Breeds of Livestock</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Study of body parts of cattle, sheep, goat, camel, yak, pig, hen, etc.</li> <li>• Visit to a livestock centre to study the breeds of livestock maintained by the centre. Also study the routine farm operations carried out by the centre.</li> </ul>
Describe the various types of housing for livestock	<ol style="list-style-type: none"> <li>1. Enlist type of houses for various animals</li> <li>2. Describe different type of animal houses</li> <li>3. Classify different types of poultry houses</li> <li>4. Describe the advantages of tail to tail system and face to face system of arrangement for cattles</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of loose housing system, cattle shed, shed for calves, etc.</li> </ol>	<p><b>Interactive lecture:</b> Housing of Animals</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Visit to Dairy farm and poultry farm to identify various types of houses</li> </ul>

	5. Describe the importance of sanitation in cattle farm/poultry farm, etc.		
Describe feed and its classification	<ol style="list-style-type: none"> <li>1. Classify animal feed</li> <li>2. Enlist animal feeds- hay, straw, silage, pelleted feeds, oils and mixed rations, sprouted grains, legumes, feed supplements, etc.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify different types of animal feeds</li> </ol>	<p><b>Interactive lecture:</b> Animal Feed</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Visit to Agricultural Farm to identify various types of fodder crops</li> <li>• Identify different types of animal feeds</li> </ul>
Differentiate between healthy and unhealthy animals	<ol style="list-style-type: none"> <li>1. Enlist symptoms of healthy and unhealthy animals</li> <li>2. Describe common diseases of cattle</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify healthy and unhealthy animals</li> <li>2. Identify common diseases of cattle</li> </ol>	<p><b>Interactive lecture:</b> Healthy Animals</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Visit to Veterinary Hospital/ Veterinary Dispensary to observe symptoms of unhealthy animals</li> </ul>
Describe milk and milk products	<ol style="list-style-type: none"> <li>1. Define milk</li> <li>2. Describe the sources of milk</li> <li>3. Describe the components of milk- water, fat, lactose, casein, proteins, minerals, etc.</li> <li>4. Describe the physical properties of milk- colour, flavor, density, specific gravity, foaming, viscosity, specific heat, etc</li> <li>5. Describe the chemical properties of milk-pH, electrical conductivity, etc</li> <li>6. Classify milk products</li> </ol>	<ol style="list-style-type: none"> <li>1. Differentiate between variety of milk</li> <li>2. Differentiate between butter and cream</li> <li>3. Identify various milk products</li> <li>4. Prepare common milk products</li> </ol>	<p><b>Interactive lecture:</b> Milk and Milk Products</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Visit to Dairy Processing Unit to understand hygiene &amp; procedural aspects of preparation of milk products</li> </ul>
Describe the importance and scope of fish culture	<ol style="list-style-type: none"> <li>1. Describe the importance of fish culture</li> <li>2. Describe the various types of fish culture-pond, etc.</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of fish culture</li> </ol>	<p><b>Interactive lecture:</b> Fish Culture</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Visit fish pond and discuss the various aspects of fish culture</li> </ul>

Unit Code : AG107-NQ2014			
Unit 7 Title : Introduction to Occupational Safety and Appropriate Technology			
(Duration: 15 hours)			
Location : Classroom and Agricultural Farm			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Describe various common hazards and risks to the farmers	1. State various causes of hazards in agriculture while using toxic agro-chemicals, tools, equipment and machinery	1. Identify and enlist hazards associated with agro-chemicals, tools and machinery	<b>Interactive lecture:</b> Hazards in Agriculture  <b>Activity:</b> <ul style="list-style-type: none"> <li>Videos or case studies with regard to common hazards and risks at agriculture farm</li> </ul>
Locate hazards and identify health related problems in an agriculture farm	1. Describe the possible health related problems at agriculture farm 2. Enlist the hazardous substances at agriculture farm	1. Enlist health related problems that may occur at an agricultural farm (eg. summer stroke, cold and cough in winters/allergic problems, asthmatic conditions) 2. Demonstrate the knowledge of dealing with health related problems 3. Identify the Personal protective equipments (clothing, gloves, leg protection, etc) used in agriculture farms 4. Demonstrate the knowledge of safety system in agriculture farms 5. Assess the risk 6. Determine the likelihood of an incident	<b>Interactive lecture:</b> Health Hazards in Agriculture  <b>Activity:</b> <ul style="list-style-type: none"> <li>Videos or case studies with regard to health hazards at agriculture farm</li> </ul>
Demonstrate the knowledge for applying safe work practices in agriculture farm	1. Describe the safety measures should be observed at the agriculture farm 2. Describe how one should be aware and handle emergency situations 3. Describe the procedure for maintaining tools and equipment in good condition and using them according to the manufacturers' instructions	1. Identify to whom to report in different emergency situations 2. Demonstrate the knowledge of handling emergencies if possible at odd hours or non-availability of concerned person e.g. fire, flood, spread of infectious disease in the livestock farm, snake bite, pesticide exposures, etc.	<b>Interactive lecture:</b> Safe work Practices in Agriculture Farm  <b>Activity:</b> <ul style="list-style-type: none"> <li>Organizing talks, demo, video sessions, etc.</li> </ul>

Describe the importance of appropriate technology in agriculture	1. Describe some examples wherein technology has been applied for capital saving, promoting sustainable agriculture, etc.	1. Demonstrate the knowledge of impact of various technologies in agriculture (for example use of tractors in place of bullock driven ploughs, use of tractors in place of bullock driven carts for transportation of raw materials and agricultural produce	<b>Interactive lecture:</b> Appropriate Technology in Agriculture  <b>Activity:</b> • Case studies
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Unit Code : AG108-NQ2014 Unit 8 Title: Marketing of Agricultural Produce (Duration: 15 hours) Location : Classroom, Agricultural Farm and Market Places			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Describe importance of Market for agricultural Produce	1. Describe importance of market of Agricultural Produce e.g. wheat, paddy, pulses, etc. to facilitate farmers in selling their agricultural produce.	1. List of benefits of markets for farmers in selling their agricultural produce.	<b>Interactive lecture</b> Importance, strategies and role of different stake holders in marketing of agricultural produce.  <b>Activity:</b> • Interaction with farmers by organizing special discussion session.
Demonstrate knowledge of various strategies and chains to facilitate farmers in selling the agricultural produce for better returns.	1. Describe various strategies and market change for agricultural produce e. g. role of cooperatives, small and commercial market places, local mandis, etc.	1. List out strategies and market chains for selling agricultural produce. 2. Describe role of various agencies involved in agricultural marketing.	<b>Interactive lecture</b> Agricultural marketing with respect to role of cooperatives and other market channels. <b>Activity:</b> • Videos of markets, organizing interactive sessions with farmers. • Visits to market places for selling of agricultural produce.
Demonstrate knowledge for factors responsible for market of agricultural produce	1. Factors responsible for market fluctuations for agricultural produce e.g. location, time span, number of commodities, margin in different crops.	1. Enlist factors responsible for fluctuations in small and large scale markets.	<b>Interactive lecture</b> Market fluctuations and factors responsible for good economic returns by appropriate market strategies for selling agricultural produce.  <b>Activity:</b> • Developing table for different crops, market chains and returns.
Describe the factors affecting demand and supply of agricultural	1. Explain concept of demand and supply and better economic returns. 2. Describe different	1. List out factors affecting demand and supply of agricultural produce such as food grains,	<b>Interactive lecture</b> on principles of demand and supply of agricultural produce and concept of demand curve.



produce.	factors affecting demand and supply plan of food grains, pulses, oil seed crops, cash crops (sugarcane, cotton, etc.).	pulses, oil seed crops, cash crops (sugarcane, cotton, etc.).	<b>Activity:</b> • Case studies in relation to different crops.
Estimation of cost, margins and price variations of different agricultural produce.	1. Describe the concept of margins and cost benefit ratio of different crops.	1. Estimate cost benefit ratio of different crops on the basis of production cost and net profit (margin).	<b>Interactive lecture</b> Cost benefit ratio and its use in calculating better economic returns.  <b>Activity:</b> • Undertaking survey to study of cost, margin and price variations in different crops.

### NSQF Level 2 (Class 10)

<b>Unit Code : AG201-NQ2014</b> <b>Unit 1 Title: Applied Agricultural Practices (Duration: 25 hours)</b> <b>Location : Classroom and Field</b>			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Describe the importance of crop production as a part of agricultural practice in Indian economy	1. Explain the importance of crop production as a source of livelihood and increasing agricultural production 2. Describe the present status of major crops in India 3. Describe the advantages of use of modern technology in agricultural practices in India	1. Identify the crop plants with their varieties 2. Demonstrate the knowledge of crop production in Indian economy 3. Demonstrate the knowledge of modern agricultural practices	<b>Interactive lectures</b> Role of crop production as a part of agricultural practice in Indian economy  <b>Activity</b> • Case study • Project work
Classify field crops based on their utility viz., carbohydrate, proteins, oil, fiber and fodder	1. Describe the major crops viz. cereals, pulses, oil seeds fiber & fodder crops 2. Enlist the nutritional content of major crops	1. Tabulate the major crops grown in different regions of India 2. Identify major crops through seed, live sample, photographs	<b>Interactive lecture</b> on major field crops based on their utility  <b>Activity:</b> • Herbarium preparation • Field demonstration
Demonstrate the knowledge of different soil chemical properties viz., pH, texture	1. Explain pH, salinity, cation exchange capacity, organic matter and C:N Ratio and its importance for	1. Determination of pH 2. Diagrammatic presentation of soil texture and structure 3. Identify soil microorganism	<b>Interactive lecture</b> <b>Soil properties</b>  <b>Activity</b> • Determination of pH

structure water holding capacity (WHC) types of soil water, soil micro-organisms	agricultural soil 2. Describe different soil beneficial micro-organisms	4. Demonstrate the knowledge of three main types of soil water (gravitational water, capillary water, and hygroscopic water)	<ul style="list-style-type: none"> <li>Field demonstration</li> </ul>
Demonstrate the knowledge of water management in crop production	1. Describe critical stages for irrigation 2. Describe importance of drainage	1. Demonstrate the knowledge of different methods of irrigation 2. Prepare schedule of irrigation	<b>Interactive lecture</b> Water Management in crop production  <b>Activity</b> <ul style="list-style-type: none"> <li>Field demonstration and video</li> </ul>
Demonstrate the knowledge of weed management	1. Describe importance of weed management in crop production. 2. Describe different methods of weed management	1. Identify important weeds of major crops 2. Demonstrate the knowledge of different weed control methods	<b>Interactive lecture</b> Weed Management  <b>Activity:</b> <ul style="list-style-type: none"> <li>Herbarium preparation</li> <li>Spot identification</li> </ul>
Describe function of different essential nutrients and recommendation of nutrients for major crops of the region	1. Describe the nutrients as primary, secondary and micro 2. What are the recommendations of major crops viz., wheat, rice, gram, soybean, sugarcane, cotton and fodder crops?	1. Enlist different nutrients with their functions 2. Prepare a list of recommended doses of nutrients for major crops	<b>Interactive lectures</b> Nutrient management  <b>Activity:</b> <ul style="list-style-type: none"> <li>Field demonstration</li> <li>Case study</li> </ul>

Unit Code : AG202-NQ2014

Unit 2 Title: Introduction to Quality of Seeds and Seed Treatment (Duration: 25 hours)

Location : Classroom and Field

Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Demonstrate the knowledge of importance of quality seed and crop improvement	1. Explain difference between grain and seed 2. Explain importance of quality seed in relation to good crop production	1. Select/segregate seeds on the basis of quality indicators. 2. Enlist the factors affecting seeds and low crop production 3. Enlist the factors responsible for good crop production by using quality seeds	<b>Interactive lecture</b> Importance of quality seeds in crop production and crop improvement.  <b>Activity:</b> <ul style="list-style-type: none"> <li>Segregation of quality seeds.</li> <li>Interactive sessions with farmers on using quality seeds</li> </ul>

Demonstrate the knowledge of seed treatment	<ol style="list-style-type: none"> <li>1. Describe the methods of seed treatment against pests and diseases</li> <li>2. Explain the common seed treatment method adopted for different crops (Rice, sugarcane, tomato, Sunflower, etc)</li> <li>3. Explain the precautions taken when handling treated seed</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of seed treatment</li> <li>2. Differentiate between healthy and diseased/ undiseased seeds</li> </ol>	<p><b>Interactive lecture</b> Seed treatment</p> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Field demonstration</li> <li>• Video on seed treatment</li> </ul>
Describe effective seed storage practices to maintain quality of seed	<ol style="list-style-type: none"> <li>1. Explain seed storage</li> <li>2. Describe the general principles of seed storage</li> <li>3. Differentiate between desirable and undesirable seed storage practices</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of good seed storage practices</li> <li>2. Enlist the types of storage requirements</li> </ol>	<p><b>Interactive lecture</b> Storage practices for maintaining quality of seeds</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Preparation of Herbarium of desirable and undesirable seeds</li> <li>• Preparation of charts showing warehouses for seeds storage.</li> <li>• Video session on storage of seeds/grain.</li> </ul>

Unit Code : AG203-NQ2014

Unit 3 Title: Introduction to Integrated Pest Management (IPM) (Duration: 25 hours)

Location : Classroom and Field

Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Demonstrate the knowledge of Integrated Pest Management (IPM)	<ol style="list-style-type: none"> <li>1. Describe the principles of IPM</li> <li>2. Describe the methods of pest management</li> <li>3. Explain the role of IPM in modern agriculture.</li> <li>4. Explain IPM in different crop ecosystems</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of IPM</li> <li>2. Enlist important pests of cotton, paddy, pulses, sugarcane, and vegetables and mention their control measures</li> </ol>	<p><b>Interactive lecture</b> Integrated Pest Management</p> <p><b>Activity:</b> Preparation of project report of important pests of major crops of your area</p>
Demonstrate the importance of cultural practices in IPM	<ol style="list-style-type: none"> <li>1. Explain cultural practices in IPM</li> <li>2. Explain principles of various cultural practices help in reducing pest incidence</li> </ol>	<ol style="list-style-type: none"> <li>1. Enlist various cultural practices adopted by the farmers of your area</li> </ol>	<p><b>Interactive lecture</b> Importance of cultural practices in IPM</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Field visit</li> </ul>

Demonstrate the utility of mechanical methods in IPM	<ol style="list-style-type: none"> <li>1. Describe various mechanical methods helpful to combat pests of major crops</li> <li>2. Explain mechanical methods work against the pest activity</li> </ol>	<ol style="list-style-type: none"> <li>1. Preparation of chart depicting mechanical methods useful to check the major pests of important crops</li> </ol>	<b>Interactive lecture</b> Utility of mechanical methods in IPM <b>Activity:</b> <ul style="list-style-type: none"> <li>• On the spot identification of various mechanical tools used against pests</li> </ul>
Describe the importance and role of biological control of pests	<ol style="list-style-type: none"> <li>1. Explain biological control of pests</li> <li>2. State the agents of biological control</li> </ol>	<ol style="list-style-type: none"> <li>1. Enlist and identify important biological agents of major pests, their use and conservation</li> </ol>	<b>Interactive lecture</b> Biological control and importance of biological control agents.  <b>Activity:</b> <ul style="list-style-type: none"> <li>• On the spot identification of natural enemies in the field</li> </ul>
Demonstrate the knowledge of use of chemicals in IPM, their benefits and harmful effects	<ol style="list-style-type: none"> <li>1. Explain different types of pesticides and their common trade names</li> <li>2. Application of solid formulations of pesticides</li> <li>3. Explain the use of fumigants in store and at home</li> <li>4. Describe the procedure of recognition of pesticides as per their formulations and application</li> </ol>	<ol style="list-style-type: none"> <li>1. Enlist important and popular pesticides being used in your area on major crops</li> <li>2. Enlist the precautions while using pesticides</li> <li>3. Demonstrate the knowledge of how liquid pesticides are dissolved in water and used on crops</li> </ol>	<b>Interactive lecture</b> Use of pesticides  <b>Activity:</b> <ul style="list-style-type: none"> <li>• Visit to local pesticide dealer to know packing and formulations of pesticides</li> <li>• Live demonstration of preparation of pesticide solutions</li> </ul>
Demonstrate the knowledge of pesticide application equipments	<ol style="list-style-type: none"> <li>1. Describe types of sprayers and dusters and their use</li> <li>2. Explain the procedure of handling and maintenance of sprayers</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of operation and minor maintenance of commonly used sprayers</li> </ol>	<b>Interactive lecture</b> Pesticide application equipments  <b>Activity:</b> <ul style="list-style-type: none"> <li>• Handling and live demonstration of commonly used sprayers</li> </ul>

<b>Unit Code : AG204-NQ2014</b> <b>Unit 4 Title: Introduction to Micro-irrigation (Duration: 25 hours)</b> <b>Location : Classroom and Field</b>			
<b>Learning Outcome</b>	<b>Knowledge Evaluation</b>	<b>Performance Evaluation</b>	<b>Teaching and Training Method</b>
Demonstrate the knowledge of Micro-irrigation	<ol style="list-style-type: none"> <li>1. Describe the importance of micro-irrigation in water saving</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the working of commercial drip irrigation System</li> </ol>	<b>Interactive lecture</b> Micro-irrigation  <b>Activity:</b>

	<ol style="list-style-type: none"> <li>Describe the basic design and working principle of micro-irrigation</li> <li>State the advantages and disadvantages of micro-irrigation</li> </ol>	and self made drip irrigation system	<ul style="list-style-type: none"> <li>Field visit</li> </ul>
Describe précised water saving technology (sprinkler and drip irrigation)	<ol style="list-style-type: none"> <li>Describe the working principle of sprinkler and drip irrigation technology</li> <li>Describe the benefits in labour saving using sprinkler and drip irrigation</li> <li>Differentiate between sprinkler irrigation and drip irrigation</li> <li>Explain the advantages of sprinkler irrigation</li> </ol>	<ol style="list-style-type: none"> <li>Demonstrate the knowledge of water saving in sprinkler irrigation</li> <li>Demonstrate the knowledge of labour saving using sprinkler irrigation</li> <li>Demonstrate the knowledge of using sprinkler irrigation in undulating area</li> </ol>	<p><b>Interactive lecture</b> Importance of sprinkler and drip irrigation</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>Field visit for demonstration</li> </ul>
Awareness about occupational health and safety measures at agriculture field in relation to micro irrigation	<ol style="list-style-type: none"> <li>Describe health and safety measure in relation to micro irrigation at agriculture field</li> <li>State the precautions to be adopted during the operation of micro irrigation tools and equipment</li> </ol>	<ol style="list-style-type: none"> <li>Enlist safety practices at agriculture field</li> <li>Enlist precautions while using tools and equipment of micro irrigation system</li> </ol>	<p><b>Interactive lecture</b> Occupational health and safety measures at agriculture field in relation to micro irrigation</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>Demonstration of safety precautions</li> </ul>

Unit Code : AG205-NQ2014

Unit 5 Title: : Introduction to Animal Husbandry Practices - Handling, Housing and Feeding  
(Duration: 25 hours)

Location : Classroom/Dairy farm/Poultry farm/Agricultural farm/Veterinary Hospital/Dispensary

Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Demonstrate the knowledge of housing system of animals	<ol style="list-style-type: none"> <li>Describe the criteria for selection of site to establish animal house</li> <li>Describe ideal animal house</li> <li>Compare various types of animal houses</li> <li>Explain suitability of animal house</li> <li>Describe poultry house</li> <li>State advantages</li> </ol>	<ol style="list-style-type: none"> <li>Identify and enlist types of animal houses</li> <li>Demonstrate the knowledge of selection of site for animal and poultry houses</li> <li>Enlist norms for an ideal animal house</li> <li>Enlist types of poultry houses</li> </ol>	<p><b>Interactive lecture</b> Housing system of animals</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>Dairy farm visit to observe various types of houses</li> <li>Poultry farm visit to observe types of poultry houses</li> <li>Draw plan for various types of animal houses</li> <li>Design poultry house</li> </ul>

	and disadvantages of different types of animal houses 7. State advantages and disadvantages of different types of poultry houses		
Describe feed and water management for livestock	<ol style="list-style-type: none"> <li>1. Describe various types of feeds</li> <li>2. Classify animal feed</li> <li>3. Define balanced diet</li> <li>4. Define various technical terms related to animal feeding</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify and select feed for animals</li> <li>2. Differentiate between legume and non-legumes</li> <li>3. Demonstrate the knowledge of assessing the quality of drinking water of animals</li> </ol>	<b>Interactive lecture</b> Feed and water management for livestock <b>Activity</b> <ul style="list-style-type: none"> <li>• Agricultural farm visit to identify various types of fodder</li> <li>• Prepare balance diet</li> </ul>
Describe characteristic features of animals	<ol style="list-style-type: none"> <li>1. Explain methods of identification of different species of animals</li> <li>2. Compare the suitability of method of identification according to the species of animal</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of appropriate methods of identification for different species of animals</li> <li>2. Identify animals</li> </ol>	<b>Interactive lecture</b> Characteristic features of animals <b>Activity</b> <ul style="list-style-type: none"> <li>• Farm visit to observe various methods of identification</li> </ul>
Explain restraining in animals.	<ol style="list-style-type: none"> <li>1. Describe the methods of restraining</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify restraining methods</li> <li>2. Enlist restraining methods according to their use</li> <li>3. Demonstrate the knowledge of appropriate methods of restraining for different species of animals</li> </ol>	<b>Interactive lecture</b> Restraining in animals <b>Activity</b> <ul style="list-style-type: none"> <li>• Demonstration of restraining of animals</li> <li>• Hands on training to restrain animals</li> </ul>
Demonstrate the knowledge of casting animals	<ol style="list-style-type: none"> <li>1. Describe the methods of casting animals</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify casting method used for livestock</li> <li>2. Demonstrate the knowledge of appropriate methods of casting for different species of animals</li> </ol>	<b>Interactive lecture</b> Casting Animals <b>Activity</b> <ul style="list-style-type: none"> <li>• Demonstration of casting of animals</li> <li>• Hands on training to cast animals</li> </ul>
Describe grooming of animals	<ol style="list-style-type: none"> <li>1. Describe methods of grooming</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify the methods of grooming animals</li> <li>2. Demonstrate the knowledge of appropriate methods of grooming for different species of animals</li> </ol>	<b>Interactive lecture</b> Grooming of animals <b>Activity</b> <ul style="list-style-type: none"> <li>• Demonstration of grooming of animals</li> <li>• Hands on training to groom animals</li> </ul>

Describe the importance of castration of bulls	<ol style="list-style-type: none"> <li>1. Describe the method of castration</li> <li>2. State advantages of castration</li> </ol>	<ol style="list-style-type: none"> <li>1. Enlist the method of castration</li> <li>2. Identify animals to be castrated</li> <li>3. Demonstrate the knowledge of appropriate time for castration</li> </ol>	<b>Interactive lecture</b> Castration of bulls  <b>Activity</b> <ul style="list-style-type: none"> <li>• Visit/video session on demonstration of castration</li> </ul>
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<b>Unit Code : AG206-NQ2014</b> <b>Unit 6 Title: Introduction to Animal Husbandry Practices - Disease Management</b> <b>(Duration: 25 hours)</b> <b>Location : Classroom/ Dairy farm/ Veterinary Hospital</b>			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Identify different types of animal diseases	<ol style="list-style-type: none"> <li>1. Enlist various animal diseases</li> <li>2. Describe the symptoms of common animal diseases</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify diseases in animals</li> </ol>	<b>Interactive lecture</b> Different types of animal diseases  <b>Activity:</b> <ul style="list-style-type: none"> <li>• Visit to dairy farm to identify various diseases</li> </ul>
Describe the preventive measures to be taken against infectious and non-infectious diseases	<ol style="list-style-type: none"> <li>1. Describe the preventive measures take against infectious and non-infectious diseases in animals</li> <li>2. Differentiate between infectious, non-infectious and contagious diseases</li> <li>3. Differentiate between animal suffering from infectious and non-infectious diseases</li> </ol>	<ol style="list-style-type: none"> <li>1. Enlist various preventive measures to be taken against animal diseases</li> </ol>	<b>Interactive lecture</b> Preventive measures against infectious and non-infectious diseases  <b>Activity</b> <ul style="list-style-type: none"> <li>• Visit to dairy farm to identify various diseases preventive measures to be taken against infectious and non-infectious diseases</li> </ul>
Describe the utility of first aid and disinfectants	<ol style="list-style-type: none"> <li>1. Describe first aid used in animal husbandry</li> <li>2. Explain the importance of first aid and disinfectants</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify first aid and disinfectants used in animal husbandry</li> <li>2. Demonstrate the knowledge of utility of first aid and disinfectants</li> </ol>	<b>Interactive lecture</b> First aid and disinfectants in animal husbandry <b>Activity</b> <ul style="list-style-type: none"> <li>• Visit to dairy farm to identify various diseases</li> <li>• Visit to Veterinary Hospital to demonstrate the techniques to give medicine</li> </ul>

Demonstrate the knowledge of techniques to give medicines to animals	<ol style="list-style-type: none"> <li>1. Describe various techniques to give medicines</li> <li>2. State the precautions to be adopted using different techniques to give medicines to animals</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify various techniques to give medicine to animals</li> <li>2. Demonstrate the knowledge of various techniques to give medicines to animals</li> </ol>	<p><b>Interactive lecture</b> Medication Techniques</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Visit to Veterinary Hospital to demonstrate the techniques to give medicine</li> </ul>
Describe management of hygiene on dairy farm	<ol style="list-style-type: none"> <li>1. Describe good dairy farm practices</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of management of hygiene on a dairy farm</li> </ol>	<p><b>Interactive lecture</b> Management of hygiene on dairy farm</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Field Visit</li> </ul>

### NSQF Level 3 (Class 11)

<p><b>Unit Code : AG301-NQ2014</b>  <b>Unit 1 Title: Introduction to Micro-irrigation (Duration: 10 hours)</b>  <b>Location : Classroom and Field</b></p>			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Describe Micro Irrigation	<ol style="list-style-type: none"> <li>1. Describe micro-irrigation</li> <li>2. State the advantages of micro-irrigation</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of micro-irrigation</li> <li>2. Enlist advantages of micro-irrigation</li> </ol>	<p><b>Interactive lecture</b> Micro Irrigation</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Field Visit</li> <li>• Video Sessions</li> </ul>
Describe précised water saving technology (sprinkler and drip irrigation)	<ol style="list-style-type: none"> <li>1. Describe the working principle of sprinkler and drip irrigation technology</li> <li>2. Describe the benefits in labour saving using sprinkler and drip irrigation</li> <li>3. Differentiate between sprinkler irrigation and drip irrigation</li> <li>4. Explain the advantages of sprinkler irrigation</li> </ol>	<ol style="list-style-type: none"> <li>1. Demonstrate the knowledge of water saving in sprinkler irrigation</li> <li>2. Demonstrate the knowledge of labour saving using sprinkler irrigation</li> <li>3. Demonstrate the knowledge of using sprinkler irrigation in undulating area</li> </ol>	<p><b>Interactive lecture</b> Importance of sprinkler and drip irrigation</p> <p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Field visit</li> </ul>

<p><b>Unit Code : AG302-NQ2014</b>  <b>Unit 2 Title: Inventory of resources and condition for sprinkler irrigation (Duration: 20 hours)</b>  <b>Location : Classroom and Field</b></p>			
Learning Outcome	Knowledge Evaluation	Performance Evaluation	Teaching and Training Method
Demonstrate the knowledge of the area in which	<ol style="list-style-type: none"> <li>1. Describe how to obtain information on water source for a</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify the topographic condition of the</li> </ol>	<p><b>Interactive lecture</b> General information required for sprinkler irrigation</p>