

AGRICULTURE (Code No. 808)

JOB ROLE: AGRICULTURE EXTENSION WORK

SESSION 2020-2021

CLASS XI

1. Introduction

Agriculture has been the prime enterprise for the National Economy of this country for centuries and that is why India is called Agrarian country. This sector also provides maximum employment to the people of this country. Agriculture is the production of food and fiber, ever since its advent. It has undergone several paradigm changes. The major landmark in Agriculture happened during 1960s when the country witnessed Green Revolution. Which boosted the crop production. Use of short duration crop varieties, fertilizers, pesticides and agricultural tools and expansion of area under irrigation were important interventions brought in Agriculture. Livestock is an integral part of Agriculture in India. Their by-products are used to build and maintain soil fertility along with plant protection. The animal products such as meat, milk and eggs are the source of nutrients in human diet as well.

Several emerging dimensions of contemporary Agriculture such as organic agriculture and animal husbandry practices are now getting attention. Food processing, value addition and preservation have been the focus of policies formation in recent times which are helpful in minimizing the wastage in Agriculture. This is helping in better income realizing through marketing of value added products. The income from Agriculture can also be increased by associating in subsidiary enterprises such as mushroom production, bio-pesticides, bee-keeping, vermi-culture etc.

2. Course Objectives

The board objectives of teaching Agriculture at Senior Secondary level are:

1. To help the students to comprehend the facts and importance of Agriculture.
2. To expose the students to crop production, animal husbandry, horticulture etc.
3. To familiarize the students with waste management and physical environment in Agriculture.
4. To expose the students to find better income and avenue generating avenue of agriculture and its associated activities.

3. Curriculum

This course is a planned sequence of instructions consisting of Units meant for developing employability and Skills competencies of students of Class XI opting for Skills subject along with general education subjects.

Theory	70 marks
Practical	30 marks
Total Marks	100 marks

The unit-wise distribution of periods and marks for Class XI is as follows:

CLASS XI SESSION (2020-2021)				
Section	Units	No. of Periods for Theory and Practical 260		Max. Marks for Theory and Practical 100
Part A	Employability Skills			
	Unit 1: Communication Skills – III	10		10
	Unit 2: Self-management Skills – III	10		
	Unit 3: Information and Communication Technology Skills – III	10		
	Unit 4: Entrepreneurial Skills – III	15		
	Unit 5: Green Skills – III	05		
	Total	50		10
Part B	Skills	Theory Periods	Practical Periods	
SECTION : I	Agriculture and Crop Production Unit: I: Scope and Importance	5	20	20
	Unit: II: Physical Environment	35		
	Unit: III: Agriculture Economics and Crop Production	35		
SECTION : II	Genetics and Plant Breeding Unit: IV Genetics and Plant Breeding	30	10	15
SECTION : III	Livestock Production Unit V: Scope and Importance	10	20	25
	Unit VI: Care and Management	40		
	Unit VII: Bio-waste Management and Government Schemes	05		
	Total	160	50	60
Part C	Practical Work			
	Practical Examination			15
	Written Test			10
	Viva Voce			05
	Total			30
Part D	Project Work/Field Visit			
	Practical File/Student Portfolio			10
	Total			10
	Grand Total			100

4. UNIT CONTENTS

CLASS XI (SESSION 2020-2021)

PART A: EMPLOYABILITY SKILLS

	Units
1.	Communication Skills- III
2.	Self-management Skills – III
3.	Information and Communication Technology Skills – III
4.	Entrepreneurial Skills – III
5.	Green Skills – III
Detailed curriculum of Employability Skills is available separately	

Part B: Skills

SECTION – I

PART A - AGRICULTURE AND CROP PRODUCTION:

Unit I: Scope and Importance:

1. Definition of Agriculture, its branches
2. Scope in the national economy and employment

Unit II: Physical Environment:

1. Climate and Weather, elements of Weather: Rainfall, Temperature, Humidity, Wind, Sunshine, Climate Change and Global warming. Introduction to various meteorological equipments.
2. Soil, Soil texture and structure and its types, distribution and area.
3. Soil erosion and Soil conservation. Reclamation of problematic soils acidic and alkali.
4. Tillage definition and types. Concept of conservation and tillage.

Unit III: Agriculture Economics and Crop Production

1. Agricultural Economics, Cooperative system in Agriculture, Crop insurance. Kisan Credit Cards. Marketing of Agricultural products (supply chain, retailing, wholesale), haats.
2. Package of practices in field crops like important varieties, seed rate, sowing time, intercropping operations, yield and marketing for Rice, Wheat, Maize, Mustard, Sunflower, Soyabean, Groundnut, Black gram, Red gram, Pea, Jute, Sugarcane, Sorghum, Pearl millet and Finger millet.
3. Package of practices of fruits: Mango, Banana, Guava, Lime, Grape, Apple, Pomegranate. Vegetables: Potato, Tomato, Cauliflower, Cabbage, Spinach, Brinjal, Bottle gourd, Pumpkin, Cucumber. Flower- Rose, Gladiolus, Marigold.
4. Types of seed-foundation and certified and methods of plant propagation – Layering and Cutting, and Tissue culture.
5. Important farm implements and their general maintenance.

SECTION II - GENETICS AND PLANTBREEDING

Unit IV: Genetics and Plant Breeding

1. Cell and its structure, cell division-Mitosis and Meiosis and their significance in plant growth and development.
2. Introduction to -DNA, RNA, and their differences.
3. Role of Genetics in Plant breeding, self and cross-pollinated crops, methods of breeding in field crops-introduction, Selection, Hybridization, Mutation.
4. Mendel's laws of Inheritance. Illustrative depiction of the Mendel's experiments, their importance in plant breeding.

SECTION - III: Livestock Production

Unit V: Scope and Importance

1. Importance of livestock in Agriculture, National Economy and Nutritional security
2. Important animal based food products and their role in our diet.
3. Important indigenous and exotic breeds of cattle, buffalo and poultry, and quantitative and qualitative production details of produces (milk, meat and eggs)
4. Concept of an and pattern of cooperative system of milk procurement and pricing of milk. Marketing of milk in India

Unit VI: Care and Management

1. Animal body structure and functions.
 2. Concept of grazing and stall feeding including poultry feeding.
 3. Principles of feeding, feeding practices; important fodder crops; Silage and Hay preparation; Balanced ratio-definition and ingredients.
 4. Housing of dairy animals and poultry animals.
 5. Management of calves, bullocks, pregnant and milch animals as well as chicks and layers.
 6. Production of milk and eggs.
 7. Systems of milking by hand and by machine. Important considerations in both these methods.
 8. Concept of clean milk production processing, pasteurization and packaging and milk. Value added products from milk.
 9. Principles of disease management and vaccination.
- (i)** Signs of sick animals, symptoms of common diseases in cattle and poultry-Rinderpest, Black quarter, Foot and Mouth, Mastitis, Haemorrhagic Septicaemia, Solmonellosis, bird flu, Fowl Pox and Rani khet disease, their prevention and control.

Unit VII: Bio-Waste Management and Government Schemes

1. Utilization of animals in Bio-wastes and Biogas plant
2. Important government schemes for development of livestock dairy and purity in India. Their important features and eligibility criteria.

5. TEACHING ACTIVITIES

The teaching and training activities have to be conducted in classroom, laboratory/ workshops and field visits. Students should be taken to field visits for interaction with experts and to expose them to the various tools, equipment, materials, procedures and operations in the workplace. Special emphasis should be laid on the occupational safety, health and hygiene during the training and field visits.

CLASSROOM ACTIVITIES

Classroom activities are an integral part of this course and interactive lecture sessions, followed by discussions should be conducted by trained teachers. Teachers should make effective use of a variety of instructional or teaching aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

PRACTICAL WORK IN LABORATORY/WORKSHOP

Practical work may include but not limited to hands-on-training, simulated training, role play, case based studies, exercises, etc. Equipment and supplies should be provided to enhance hands-on learning experience of students. Only trained personnel should teach specialized techniques. A training plan that reflects tools, equipment, materials, skills and activities to be performed by the students should be submitted by the teacher to the Head of the Institution.

SKILL ASSESSMENT (PRACTICAL)

Assessment of skills by the students should be done by the assessors/examiners on the basis of practical demonstration of skills by the candidate, Practical examination allows candidates to demonstrate that they have the knowledge and understanding of performing a task. This will include hands-on practical exam and viva voce. For practical, there should be a team of two evaluators. The same team of examiners will conduct the viva voce.

Project Work (individual or group project) is a great way to assess the practical skills on a certain time period or timeline. Project work should be given on the basis of the capability of the individual to perform the tasks or activities involved in the project. Projects should be discussed in the class and the teacher should periodically monitor the progress of the project and provide feedback for improvement and innovation. Field visits should be organised as part of the project work. Field visits can be followed by a small-group work/project work. When the class returns from the field visit, each group might be asked to use the information that they have gathered to prepare presentations or reports of their observations. Project work should be assessed on the basis of practical file or student portfolio.

Student Portfolio is a compilation of documents that supports the candidate's claim of competence. Documents may include reports, articles, photos of products prepared by students in relation to the unit of competency.

Viva voce allows candidates to demonstrate communication skills and content knowledge. Audio or video recording can be done at the time of viva voce. The number of external examiners would be decided as per the existing norms of the Board and these norms should be suitably adopted/adapted as per the specific requirements of the subject. Viva voce should also be conducted to obtain feedback on the student's experiences and learning during the project work/field visits.

6. ORGANISATION OF FIELD VISITS/EDUCATIONAL TOURS

In field visits, children will go outside the classroom to obtain specific information from experts or to make observations of the activities. A checklist of observations to be made by the students during the field visits should be developed by the Teachers for systematic collection of information by the students on the various aspects. Principals and Teachers should identify the different opportunities for field visits within a short distance from the school and make necessary arrangements for the visits. At least three field visits should be conducted in a year.

7. LIST OF EQUIPMENT AND MATERIAL

The list given below is suggestive and an exhaustive list should be prepared by the skill teacher. Only basic tools, equipment and accessories should be procured by the Institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

1.	Tape	35.	Pruning knife
2.	Crow bar	36.	Super cut
3.	Rope	37.	Thinning scissor
4.	Khurpi	38.	Hand cultivator
5.	Wheel hoe	39.	Hand weedier
6.	Trenching hoe	40.	Weeding fork
7.	Transplanting travel	41.	Garden hoe
8.	Dibbler	42.	Shovel
9.	Planting board	43.	Digging fork
10.	Secateurs	44.	Garden rake
11.	Garden hatchet	45.	Spade
12.	Water can	46.	Small Trowel
13.	Sprinkler	47.	Rake
14.	Sprayer	48.	Drip and sprinkler
15.	Duster	49.	Mobile benches
16.	Temperature & humidity control	50.	Fan
17.	System	51.	Pad
18.	Automatic shade system	52.	Ventilator
19.	Fogging and blackout	53.	Thermometer
20.	Irrigation system	54.	Lux meter/Light meter
21.	Mobile benches,	55.	Misting
22.	Fan	56.	Digitale ectronic temperature indicator
23.	Pad		
24.	Ventilator	57.	Radiation measuring instrument
25.	Thermometer	58.	Sprayer
26.	Lux meter/Light meter	59.	Hygrometer
27.	Digital electronic temperature Indicator	List of Chemicals	
		60.	Dry and liquid fertilizer
28.	Radiation measuring instrument	61.	Peat
29.	Sprayer	62.	Formalin
30.	Hygrometer.	63.	Bavestin
31.	Temperature & humidity control	64.	Sulphur

	System	65.	Insecticide
32.	Automatic shade system	66.	Indofil-45
33.	Fogging and blackout	67.	Neem cake
34.	Irrigation system	68.	Plant Growth regulator/hormones

8. PRACTICAL GUIDELINES

SECTION – I & II

Agriculture and Crop Production and Genetics & Plant Breeding

- (a) Visit to a crop field. Identify different crops growing in the field and make a report.
- (b) Identification of farm implements used for different operations, draw a design of at least 5 implements and make a report.
- (c) Identification of seeds of different crops.
- (d) Seed germination test. (two cereals, two pulses, two vegetables, two flowers)
- (e) Calculation of cost of production of wheat crop in one hectare of land area & prepare a report.
- (f) Visit to an orchard and identify different fruit crops and make a report.
- (g) Identification of important vegetable crops, prepare a report.
- (h) Identification of important flower crops.
- (i) Orchard layout, digging of pits and planting of sapling of any one fruit crop.
- (j) Land preparation and sowing of wheat crop seed in the bed.

SECTION – III

- (k) Identification of body parts of dairy animals and Poultry.
- (l) Identification of common breeds of cows, buffaloes and poultry birds.
- (m) Handling and restraining of animals.
- (n) Testing of milk fat and SNF.
- (o) Visit to a local veterinary hospital and observe the condition of a sick animal and prepare a report.
- (p) Compute ration for an animal and poultry and prepare a report.
- (q) Visit to milk processing plant and on outlet a milk & milk products centre. Record the processing & sale of variety in milk based products.
- (r) Identification of feeds, fodder crops and grasses.
- (s) Visit to Biogas plant.

Report on the Visits

1. The student has to prepare a report of their visit to different organizations and submit to the subject teacher for the evaluation. The report must contain the student's original work and observations.
2. Prepare Herbarium of different crops and weed species. The leaves of the crops and weeds are pressed, dried and mounted on the Herbarium sheet.

Viva-Voce

Students can be asked questions based on:

- (i) Identification of objects
- (ii) Visit Report analysis.
- (iii) Experiences in their field visits, etc.

A range of 5 to 10 questions can be asked depending on the response of the student. Evaluation $5 \times 1 = 5$ or should be based on number of questions answered. Evaluator should stick to the time and $\frac{1}{2} \times 10 = 5$ number of questions.