

# **SKILL FACULTY OF AGRICULTURE**

**B. Voc. (Agriculture)**

**Scheme-3 Year Course**

**2022-25**



**SHRIVISHWAKRMA SKILL UNIVERSITY**

**DUDHOLA, PALWAL**

**B.Voc.Agriculture-SemesterIII**

Category	Subject Code	Subjects	Credits			Hours			Theory (Marks)			Practical (Marks)			Total
			Th	P	To	Th	P	To	I	E	To	I	E	To	
General Education Component	AGB-21301	Fundamentals of Vegetable Growing	3	1	4	45	30	75	30	70	100	35	15	50	150
	AGB-21302	Seed, Soil and Fertilizer Management	3	1	4	45	30	75	30	70	100	35	15	50	150
			<b>6</b>	<b>2</b>	<b>8</b>	<b>90</b>	<b>60</b>	<b>150</b>	<b>60</b>	<b>240</b>	<b>200</b>	<b>70</b>	<b>30</b>	<b>100</b>	<b>300</b>
Skill Education Component	AGB-21304	Vermicompost Production-1	3	2	5	45	60	105	30	70	100	35	15	50	150
	AGB-21305	Vermicompost Production-2	3	2	5	45	60	105	30	70	100	35	15	50	150
	AGB-21306	Aquaculture Techniques	3	2	5	45	60	105	30	70	100	35	15	50	150
	AGB-21303	Integrated Pest and Disease Management in Agriculture	3	2	5	45	60	105	30	70	100	35	15	50	150
			<b>12</b>	<b>8</b>	<b>20</b>	<b>180</b>	<b>240</b>	<b>420</b>	<b>120</b>	<b>280</b>	<b>400</b>	<b>140</b>	<b>60</b>	<b>200</b>	<b>600</b>
		Total	<b>18</b>	<b>10</b>	<b>28</b>	<b>270</b>	<b>300</b>	<b>570</b>	<b>180</b>	<b>520</b>	<b>600</b>	<b>210</b>	<b>90</b>	<b>300</b>	<b>900</b>

**B.Voc. Agriculture-Semester: IV**

Category	Subject Code	Subjects	Credits			Hours			Theory (Marks)			Practical (Marks)			Total
			Th	P	To	Th	P	To	I	E	To	I	E	To	
General Education Component	AGB-21401	MOOC/Online Contents - III	3	0	3	45	0	0	30	70	100	0	0	0	100
	AGB-21402	MOOC/Online Contents - IV	2	0	2	30	0	0	30	70	100	0	0	0	100
			<b>5</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>60</b>	<b>140</b>	<b>200</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>200</b>
Skill Education Component	AGB-21403	<b><u>OJT</u></b> Vermicompost Production (110 hrs) Aquaculture Techniques (142 hrs) Agriculture Practices (438 hrs)	0	23	23	0	690	690	0	0	0	350	150	500	500
			<b>0</b>	<b>23</b>	<b>23</b>	<b>0</b>	<b>690</b>	<b>690</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>350</b>	<b>150</b>	<b>500</b>	<b>500</b>
		<b>Total</b>	<b>5</b>	<b>23</b>	<b>28</b>	<b>0</b>	<b>690</b>	<b>690</b>	<b>60</b>	<b>140</b>	<b>200</b>	<b>350</b>	<b>150</b>	<b>500</b>	<b>700</b>



**B.Voc. Agriculture  
Complete Syllabus  
Semester III**

**Subject: Fundamental of Vegetable Growing**

**Subject Code: AGB 21301**

**Course credit: 04 (3-1-0)**

**Max. Marks: 100 (30I+70E); 50(35I+15E)**

**Course Objectives:**

This course is designed to provide students with an in-depth understanding of the principles and practices of vegetable physiology and sustainable crops production. The soil fertility management, stand establishments (seed, transplantation and propagation), protected structure (shade nets, net houses, tunnels, greenhouses), pest management.

**Theory**

**UNIT I**

Sustainable agriculture, General Aspects of Vegetable Growing in India: Background, present status, problems, scope, and importance in dietary and economic value. Origin, distribution, classification and nomenclature and growth habits. Soil and Climatic Requirements in Vegetable Production: Soil, temperature, light, air, water, rainfall and humidity. Introduction to Vegetable Industry.

**UNIT II**

Propagation and Planting Methods: Types, different propagation methods with merits and demerits. Principles and Practices of Vegetable Growing: Land preparation, spacing, irrigation, manures and fertilizers, inter tillage, crop rotation and multiple cropping, gap filling, weeding, mulching, thinning, pest and disease control and management, harvesting.

**UNIT III**

Production Technology of the Various Vegetable Crops: Solanaceous Crop, Root crops, Cole crops. Green House Vegetable. Organic vegetable production.

**UNIT IV**

Post-harvest Management of Vegetables: Processing, grading, storing, packaging and marketing of different vegetables (Import and export), Introduction to Local/ Community Food Programs related to vegetables. Government subsidies.

**Practical**

Identification of vegetables/ morphological characteristics, vegetable seeds and seedlings. Computing manures and fertilizers for vegetables cultivation. Computing seed rates in vegetable production. Practicing intercultural operations in vegetable cultivation. Preparation of seedbed and raising of vegetable seedlings. Methods of planting vegetable crops. Field layout and cultivation of vegetables in plot. Visit to a vegetable producing and processing farm. Seed germination and seedling vigour test. Extraction and processing of tomato, brinjal and bottle gourd seeds. Grading and packaging of vegetables, case studies related to vegetable experiments.

**Suggested books:**

1. S. P. Singh. 1997. Principles of Vegetable Production. Mrs. GeetaSomani. Agrotech. Publishing Academy, Udaypur, India.
2. P. Mathew and S. K. Karikari. 1986. Horticulture: Principles and Practices. Macmillian, Intermediate Agriculture Series, America.
3. K. G. Shanmugavelu. 1989. Production Technology of Vegetable Crops. Oxford and IBH Publishing Co. Pvt. Ltd. NewDelhi, India.
4. H. C. Thompson and W. C. Kelly. 1983. Vegetable Crops. Tata Mc Graw-Hill Publishing Co. Ltd., NewDelhi, India.
5. Dr.K.L Chadda. 2005.Handbook of Horticulture. ICAR publications.
6. Practical Manual on fundamentals of vegetable production by Dr.Sanjive Kumar Singh

## **Subject: Seed, Soil and Fertilizer Management**

**Subject Code: AGB 21302**

**Course credit: 04 (3-1-0)**

**Max. Marks: 100 (30I+70E); 50(35I+15E)**

### **Course Objectives:**

To teach students about types of seeds testing, seed certification, maintenance of seed quality standards during seed production, processing and marketing, foundation and certified seed production of important cereals, pulses, oilseeds, fodder and vegetables crops. To provide an understanding about soil, soil genesis, soil profile, physical properties of soil, soil reaction, soil organic matter and soil pollution. Understanding of different fertilizer and its use.

### **Theory**

#### **UNIT I**

Floral Biology of important crop plants, seeds, types of seed: monocotyledons and dicotyledons, embryo of dicots and monocots, embryogenesis, Seed testing, ISTA rules for testing, moisture, purity, germination, vigor test, seed sampling, aspects of determination of seed viability, seed health testing; seed dormancy and types of dormancy, different classes of seeds - foundation and certified seeds, seed certification, field inspection, GM seeds and their detection, seed treatment, seed storage, germination of seeds.

#### **UNIT II**

Soil genesis: soil forming rocks and minerals; weathering, processes and factors of soil formation. Soil Profile, Soil taxonomy; order, sub-order, grade and groups. components of soil; Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistency and plasticity; Soil moisture, composition, gaseous exchange, problem and plant growth, Soil temperature; source, amount and flow of heat in soil; effect on plant growth. Soil chemical properties, pH and Electrical Conductivity, soil fertility and reclamation of acidic and sodic soil.

#### **UNIT III**

Soil organic matter: composition, properties and its influence on soil properties; humus substances - nature and properties; soil organisms: macro and microorganisms, their beneficial and harmful effects; Soil pollution - behaviour of pesticides and inorganic contaminants, prevention and mitigation of soil pollution.

#### **UNIT IV**

Nutrient requirement of different crops. Fertilizers: Difference between fertilizer and manure, Integrated nutrient Management Fertilizers -Nitrogenous, phosphatic, potassic, Secondary and micronutrient fertilizers, Economics of Fertilizer use. Method of fertilizer application. Soil Health card. Complex fertilizers, Nano fertilizer, Soil amendments.

### **Practical:**

Attempting artificial crosses. Seed and seedling vigour test, A case study on seed testing laboratories and seed processing plant for seed cleaning, grading and packaging. Study on seed treatment methods, seed priming and pelleting. Study based on practices in rouging and seed storage. Study of soil profile in the field. Determination of soil texture by feel and Bouyoucos Methods. Determination of Total and organic Carbon, soil pH and electrical conductivity. Study of soil maps. A visit of students to soil testing laboratory; Identification of different types of seeds,

cereals, pulses, oilseeds, fodder and vegetables; Identification of different fertilizers and their amendments.

**Suggested Books:**

1. Khare, Dhirendera and Bhale, Mohan S. 2000. Seed Technology. Scientific Publishers(India), Jodhpur.
2. Joshi, A.K. and Singh, B.D. 2013. Seed Technology. Kalyani Publishers, New Delhi.
3. Basavraju, G. V., Ravishankar, P. and Gowdiperu, Sarika. 2014. A Text book of SeedScience and Technology. Kalyani Publishers.
4. Chhabra AK. 2021. Floral biology of crop plants. 2<sup>nd</sup> edition. Earth Vision Publications. Gurugram, Pages 288.
5. Chemical Analysis of Soil and Plant Samples by Ummed Singh C S Praharaj



**Subject: Vermicompost production I**

**Subject Code: AGB 21304**

**Course credit: 05 (3-2-0)**

**Max. Marks: 100 (30I+70E); 50(35I+15E)**

**Course Objectives:**

To teach students about the natural farming, farm management and vermicomposting, so that they can be aware of the mitigation methods for environment degradation.

**Theory:**

### **UNIT I**

Introduction to vermiculture, definition, classification, history, economic important, their value in maintenance of soil structure. Its role in bio transformation of the residues generated by human activity and production of organic fertilizers. Choosing the right worm. Useful species of earthworms. Local species of earthworms. Exotic species of earthworms.

### **UNIT II**

Limit factors (gases, diet, humidity, temperature, pH, light, and climatic factors). Physio- chemical parameters of vermicompost Different Methods of Vermicomposting: Small- and large-scale., Pit method Earthworm compost for home gardens Conventional commercial composting – Earthworm Composting larger scale Pest and diseases of earthworms. Frequent problems. How to prevent and fix them. Complementary activities of auto evaluation. Nutritional Composition of Vermicompost for plants, comparison with other fertilizer.

### **UNIT III**

Bedding: definition; Raw material required (Bio-degradable, organic matter), How to prepare; Earthworm Farming (Vermiculture), Extraction (harvest), vermicomposting harvest and processing. Small Scale Earthworm farming for home garden. Conventional commercial composting. Harvesting, packaging, transport and storage of Vermicompost and separation

### **UNIT IV**

Construction of vermicompost unit- raw material required, e.g. cement, bricks, stones, asbestos sheets, rocks, bamboo, plastics, wood, etc. Accessories: e.g. gunny bag, tin sheet, plastic sheet, etc., Site selection.

**Practical:**

Scientific classification of Earthworm, Study of external morphology of Earthworm, Study of habit and habitat of Earthworm. Study of Digestive system of earthworm, Study of Reproduction of earthworm, Vermicomposting unit. Study of Pests and diseases of Earthworms

**Suggested books:**

1. Textbook of Vermicompost: Vermiwash and Biopesticides by Dr Keshav Singh
2. The Worm Farmer's Handbook by Rhonda Sherman
3. Radha D Kale. 2006. Vermicompost- Crown Jewel of organic farming. N.D.Kale Publishers.
4. C A Edward; P Bohlen.1986. Biology and ecology of earthworms. 3rd edition, Chapman & Hall, London.
5. J E Satchatt, (ed.).1983. Earthworm Ecology. From Darwin to Vermiculture.Metheven, New York (ASymposium Volume).

6. J A Wallwork. 1983. Earthworm Body. Edward Arnold and University Press, Baltimore.
7. Practical Manual on vermicompost technology by Dr.E.Sreenivasan
8. Manual of On-Farm Vermicomposting and Vermiculture by Glenn Munroe

**Subject: Vermicompost production II**

**Subject Code: AGB 21305**

**Course credit: 05 (3-2-0)**

**Max. Marks: 100 (30I+70E); 50(35I+15E)**

**Course objectives:**

To teach students about the natural farming, farm management and vermicomposting, so that they can be aware of the mitigation methods environment degradation.

**Theory:**

**UNIT I**

Selection of Earthworms and inoculation: Prepare to inoculate earthworms, Inoculate earthworms into vermicomposting unit, Prepare feed and manage vermicomposting unit, Control predator attacks.

**UNIT II**

Harvesting of compost: Methods, type of equipment required, Tools and materials; Quality parameters, Maturity of vermicompost and storage; Post -harvest procedures: Collect worms in containers, weigh, sort, grade, transfer in ready bed, prepare for sale, recycle the process; drying of compost.

**UNIT III**

Entrepreneurship activities: regulations, government subsidies, promotion of Vermicompost, standards, policies and procedures related to produce, health, safety and hygiene at work place, Market study, market value determination, margin of profit.

**Practical:**

Collection of earthworms, preparation of vermicompost bed, preparation of feed, checking quality parameters of vermicompost. Pit method, Establishment of vermicomposting unit Bed method. Establishment of vermi wash unit, Vermicompost production, harvesting and packaging. Study of cocoon and vermi cast.

**Suggested reading:**

1. Radha D. Kale. Earthworm: Cinderella of organic farming. Prism book pvt. Ltd. 2000.
2. Radha D Kale. Vermicompost- Crown Jewel of organic farming. N.D.Kale Publishers. 2006
3. C A Edward & P Bohlen. Biology and ecology of earthworms. 3rd edition, Chapman & Hall, London.1986.
4. J E Satchatt, (ed.): Earthworm Ecology. From Darwin to Vermiculture.Metheven, New York (A Symposium Volume). 1983.
5. J A Wallwork. Earthworm Body. Edward Arnold and University Press, Baltimore. 1983.
6. Practical Manual on vermicompost technology by Dr.E.Sreenivasan
7. Manual of On-Farm Vermicomposting and Vermiculture By Glenn Munroe

**Subject: Aquaculture Techniques**

**Subject Code: AGB-21306**

**Course Credit: 05 (3-2-0)**

**Max. Marks: 100 (30I+70E); 50(35I+15E)**

**Course Objective:** The learners will be able to understand the importance of aquaculture, nutritional requirements and to increase the productivity and applicability of the aquaculture technique.

**Theory**

### **UNIT I**

Concept of Blue Revolution - History and definition of Aquaculture Scope of Aquaculture at global Level and India. Different Aquaculture systems: Pond, Cage, Pen, Running water, Extensive, Intensive; Semi-Intensive Systems and their significance. Monoculture, Polyculture and Monosex culture systems. Recent aquaculture system: RAS, Bio flock system and integrated aquaculture system, etc., Feed technology. Candidate species for aquaculture system (fresh and saline) with particular reference to Haryana, water quality requirement and its management, diet management and health management (disease, causal microorganism and mitigation)

### **UNIT II**

General Concepts of Ecology, Carrying Capacity and Food Chains Lotic and lentic systems, streams and springs. Nutrient Cycles in Culture Ponds Phosphorus, Carbon and Nitrogen. Importance of Plankton and Benthos in culture ponds, nutrient dynamics and algal blooms. Concepts of Productivity, estimation and improvement of productivity.

### **UNIT III**

Classification of ponds based on water resources and spring, rain water, flood water, well water and water course ponds. Functional classification of ponds and head pond, hatchery, nursery ponds. Functional classification of ponds -rearing, production, stocking and quarantine ponds. Fish Hatchery design.

### **UNIT IV**

Important factors in the construction of an ideal fish pond and site selection, topography Important factors in the construction of an ideal fish pond- nature of the soil, water resources. Lay out and arrangements of ponds in a fish farm. Construction of an ideal fish pond and space allocation, structure and components of barrage pond. Water quality and management

### **UNIT V**

Need of fertilizer and manure application in culture ponds Role of nutrients; NPK contents of different fertilizers and manures used in aquaculture; and precautions in their application

**Practical:**

Estimation of Transparency, pH and dissolved oxygen in pond water, Estimation of Total alkalinity, Carbonates, Bicarbonates in water samples, Estimation of Total hardness in water samples, Estimation of salinity, Estimation of orthophosphates and ammonia in water, Field visit to nursery, rearing and stocking ponds of aquafarms, Field visit to hatchery, Study of algal blooms and their control, Collection & identification of zooplankton and phytoplankton. Study of aeration

devices. Determination of soil nitrogen and phosphorus, Collection and study of aquatic weeds and insects. Field survey of nearby habitat for dietary dependency on and requirement of aqua products; Identification and rearing of suitable aquaculture species for Haryana(rearing).

**Suggested books:**

1. Jhingran VG 1998. Fish and Fisheries of India. Hindusthan Publishing Corporation, New Delhi
2. Pillay TVR, 1996. Aquaculture Principles and Practices, Fishing News Books Ltd., London
3. Pillay TVR & M.A. Dill, 1979. Advances in Aquaculture. Fishing News Books Ltd., London
4. Stickney RR 1979. Principles of Warm Water Aquaculture. John Wiley & Sons Inc. 1981
5. Boyd CE 1982. Water Quality Management for Pond Fish Culture. Elsevier Scientific Publishing
6. Bose AN et al., 1991. Coastal Aquaculture Engineering. Oxford & IBH Publishing Company
7. Practical Manual on Aquaculture Techniques by Felix and Betsy
8. Practical Manual on Aquaculture Techniques by FoA

**SUBJECT: Integrated pest and disease management in Agriculture**

**SUBJECT CODE: AGB-21303**

**Course Credit: 05 (3-2-0)**

**Max. Marks: 100 (30I+70E); 50(35I+15E)**

**Learning Outcome:**

LO1: Identify different plant diseases and their biotic and abiotic factors.

LO1: Understand the method of insect pests Detection and their biotic and abiotic factors

LO3: Enable to know about the resurgence and outbreak of pest and the losses caused by them.

LO4: Enable to take decision for pest management through the IPM.

### **UNIT-I**

Fundamentals of Plant Pathology: Introduction to plant diseases and Plant Pathology; Causes / factors affecting disease development; Commonly grown crops in local area: Diseases and Pests affecting them; Diseases and symptoms due to abiotic causes.

### **UNIT-II**

Fundamentals of Entomology: Introduction to Entomology; Insect Ecology; Introduction to Environment and its Components; Effects of abiotic and biotic factors (On Insect Ecology); Methods of detection and diagnosis of insect pest and diseases.

### **UNIT-III**

Fundamentals of Pests, Pest outbreaks, resurgence and losses caused by pests: Pest Definition and Introduction; Categories of pests- Based on Occurrence and Based on level of Infestation; Causes of pest outbreak; Deforestation; Identify the stages of pest incidence - Destruction of natural enemies, Intensive and Extensive cultivation, Introduction of new varieties and crops, Improved agronomic practices, Introduction of new pest in new environment, Accidental introduction of pests from foreign countries, Large scale storage of food grains; Resurgence of Pests; Losses Caused by Pests.

### **UNIT-IV**

Integrated Pest Management: Principles and concepts of Integrated pest Management; History of Pest Management; Concept of Pest Management; Concept of Integrated Pest Management; Ecological management of crop environment; Introduction to conventional pesticides for the insect pests and disease management; Aim of Selected IPM strategies and modules; Resistant varieties, crop rotation, inter crop, border crop, trap crops, intercultural operations, understand the natural enemies of pest, beneficial insects, bio-insecticides, etc; Case histories of important IPM programme.

Practicals:

1. Methods of diagnosis and detection of various insect pests and plant diseases.

2. Methods of insect pests and plant disease measurement,
3. Assessment of crop yield losses, calculations based on economics of IPM,
4. Identification of biocontrol agents, different predators and natural enemies.
5. Mass multiplication of *Trichoderma*, *Pseudomonas*, *Trichogramma*, NPV etc.
6. IPM module and decision making.
7. Visit at IPM centres.

Recommended Readings:

- Arora Ramesh and Dhaliwal, G.S. Integrated Pest Management Concept. Kalyani Publisher
- Dhaliwal, G.S.; Singh, Ram and Jindal, Vikas. A Text *Book of Integrated Pest Management*. Kalyani Publisher