

## **Department of B.Voc Programmes**

### **Programme Outcome**

#### **B.VOC AGRICULTURE TECHNOLOGY**

Upon successful completion of this course, students should be able to:

- To get motivated and enrich with knowledge in the field of agriculture.
- To learn the basic principles and methods for cultivation of different crops.
- To understand about different pests that may occur in crops and learn about their control measures.
- To familiarize with bio and synthetic fertilizers, weedicides, pesticides, insecticides etc.
- To construct a field layout for different plantation and horticultural crops.
- Learn the working principle and operating methods of different farm machineries.
- To know about livestock farming and agribusiness management.
- To Visit a number of agricultural fields, gardens, plantations and nurseries, so that they will get a skilled knowledge about the farming practices, nursery management, problems faced by the farmers etc.
- Learn the post-harvest processing and value addition of agricultural produce.
- To get awareness about the national and international standards and regulatory authorities related to the use of fertilizers and farming practices.
- Knowledge about government subsidies, grants and other programs to buy agricultural machineries, seeds, fertilizers etc. and for starting up their own agricultural business.

## **B.Voc AGRICULTURE TECHNOLOGY**

### **COURSE OUTCOME**

#### **Semester 1**

##### **BAT1S01- Fundamentals of Agronomy**

1. **Foundational Knowledge:** to have a strong grasp of the fundamental concepts, theories, and terminology related to agronomy, including soil science, crop physiology, and agronomic practices.
2. **Soil Health and Fertility:** to understand the principles of soil science and fertility management, including soil testing, nutrient management, and sustainable soil conservation practices.
3. **Crop Growth and Development:** Students will have a deep comprehension of the growth and developmental stages of major crops, including factors affecting growth, yield potential, and strategies for optimizing crop production.
4. **Pest and Disease Management:** Students will be proficient in identifying common pests and diseases that affect crops, and they will be capable of implementing integrated pest management strategies to mitigate their impact sustainably.
5. **Crop Rotation and Diversification:** to appreciate the benefits of crop rotation, diversification, and intercropping systems in enhancing soil health, pest management, and overall agricultural sustainability.
6. **Sustainable Agriculture Practices:** to understand and promote sustainable agricultural practices, such as organic farming, conservation tillage, and precision agriculture, to minimize environmental impacts and maximize productivity.

##### **BAT1S02- Fundamentals of Horticulture**

1. **Foundational Knowledge:** Students will have a solid grasp of the fundamental concepts, theories, and terminology related to horticulture, including plant biology, growth, and development.
2. **Plant Identification and Selection:** Students will be able to identify a wide range of horticultural plants, including ornamental, fruit, and vegetable species, and make informed decisions regarding their selection and cultivation based on environmental factors and market demands.

3. **Propagation Techniques:** to be proficient in various propagation methods, including seed germination, vegetative propagation, grafting, and tissue culture, and apply these techniques to reproduce plants accurately.
4. **Soil and Growing Media:** to understand the importance of soil health and composition, as well as alternative growing media, and how they impact plant growth, nutrient uptake, and water management.
5. **Nutrition and Fertilization:** to know how to assess plant nutrient requirements, formulate appropriate fertilization programs, and employ sustainable practices to enhance plant nutrition while minimizing environmental impacts.
6. **Pest and Disease Management:** Students will be skilled in identifying and managing common pests, diseases, and disorders affecting horticultural crops, implementing integrated pest management strategies for effective control.

#### **BAT1S03-Fundamentals of Soil Sciences**

1. **Foundational Knowledge:** to possess a solid grasp of the fundamental principles, theories, and terminology related to soil science, including soil composition, structure, and properties.
2. **Soil Physical Properties:** to be proficient in assessing soil physical properties, such as texture, structure, porosity, and bulk density, and their impact on soil water retention, aeration, and root growth.
3. **Soil Chemical Properties:** to be capable of evaluating soil chemical properties, including pH, nutrient content, cation exchange capacity, and their significance in nutrient availability, soil fertility, and plant growth.
4. **Soil Remediation:** to be familiar with problem soils of Kerala and their soil remediation techniques and approaches to address soil contamination issues, including the removal or neutralization of harmful substances.
5. **Plant nutrition:** to understand about different plant nutrients, their essentiality, classification and deficiency symptoms in plants.

#### **BAT1S04-Setting up of crop museum [AOC]**

To develop skill in setting up of a crop museum for major field crops.

## Semester-II

### **BAT2S01-Fundamentals of Entomology and Insect ecology**

1. **Foundational Knowledge:** to possess a strong grasp of fundamental entomological concepts, including insect anatomy, physiology, taxonomy, and life cycles.
2. **Insect Diversity and Classification:** to be able to identify and classify insects into major orders and families, as well as recognize common insect species and their ecological significance.
3. **Insect Behavior and Ecology:** to understand insect behavior patterns, such as feeding, reproduction, communication, and migration, and how these behaviors influence their interactions with other organisms and their environment.
4. **Insect Life Histories:** to be proficient in describing the life histories of various insect species, including metamorphosis, development stages, and the ecological adaptations of different life cycles.
5. **Insect-Plant Interactions:** to recognize the complex relationships between insects and plants, including pollination, herbivory, and mutualistic interactions, and their ecological and economic implications.

### **BAT2S02- Plantation Crops, Spices and Fruits**

1. To acquire skill on cultivation aspects of Plantation crops, spices and fruit crops.
2. To be proficient in the techniques of crop establishment, including seed selection, nursery management, planting, and propagation methods such as grafting and budding.
3. To have the skills to assess soil fertility, diagnose nutrient deficiencies, and formulate appropriate soil management and fertilization strategies for optimal crop growth and yield
4. To adept at identifying common pests and diseases affecting plantation crops, spices, and fruits and implementing integrated pest management (IPM) practices to mitigate their impact sustainably.
5. To determine the optimal timing for harvest, employ proper harvesting techniques, and understand post-harvest handling methods to maintain product quality and shelf life.

### **BAT2S03- Fundamentals of Agricultural Engineering**

1. Students will be proficient in the selection, operation, and maintenance of various types of agricultural machinery and equipment, such as tractors, plows, harvesters, and irrigation systems.
2. To familiarize with fundamentals of water management measures
3. To acquaint with various soil conservation methods

4. To understand about various surveying techniques.

### **BAT2G03-Cultivation of coconut, pepper and banana [AOC]**

1. To develop skill and to get experience in the cultivation practices of coconut, pepper and banana.
2. To practice high density planting of banana precision farming, fertigation of banana

## **Semester-III**

### **BAT3S01- Fundamentals of Plant Pathology and crop disease management**

1. **Foundational Knowledge:** possess a strong grasp of the fundamental concepts, theories, and terminology related to plant pathology, including the biology of plant pathogens and their interactions with host plants.
2. **Plant Pathogen Identification:** be proficient in identifying common plant pathogens, including fungi, bacteria, viruses, nematodes, and other microorganisms, using various diagnostic techniques
3. **Disease Cycles and Epidemiology:** understand the life cycles of plant pathogens, disease epidemiology, and the factors influencing disease spread, including environmental conditions and host-pathogen interactions.
4. **Integrated Disease Management (IDM):** recognize the importance of IDM strategies, combining cultural practices, resistant cultivars, chemical controls, and biological agents to minimize disease impact sustainably.
5. To develop skill in preparing and using plant protection chemicals and use of plant protection equipment.

### **BAT3S02-Plant Physiology**

1. **Foundational Knowledge:** possess a strong grasp of essential plant physiology concepts, including plant cells and tissues, growth and development, and energy metabolism.
2. **Plant Growth and Development:** able to explain the processes of plant growth, including cell division, elongation, and differentiation, and understand the factors influencing plant development, such as hormones and environmental cues.
3. **Photosynthesis:** comprehend the mechanisms of photosynthesis, including light absorption, carbon fixation, and the production of carbohydrates, as well as the factors affecting photosynthetic rates.
4. **Respiration:** understand the process of respiration in plants, including glycolysis, the citric acid cycle, and electron transport, and appreciate the relationship between respiration and energy production.

5. **Transpiration and Water Transport:** be proficient in explaining water uptake, transport, and loss in plants, as well as the role of transpiration in nutrient uptake and temperature regulation.

### **BAT3S03-Integrated Pest management in crops**

1. **Foundational Knowledge:** possess a solid grasp of the fundamental concepts, theories, and terminology related to integrated pest management, including the biology of pests and beneficial organisms.
2. **Pest Identification:** proficient in identifying common crop pests, including insects, diseases, weeds, and nematodes, using various diagnostic methods.
3. **Pest Biology and Life Cycles:** understand the biology, life cycles, and ecology of key pests, including their development stages, behavior, and reproductive strategies.
4. **Biological Control:** understand the principles of biological control, including the introduction and conservation of natural enemies, and the use of biopesticides for pest management
5. **Chemical Control:** familiarity with the judicious use of pesticides, including insecticides, fungicides, and herbicides, while emphasizing safety, efficacy, and resistance management.

### **BAT3G03 -Protected Cultivation of Horticultural crops**

1. **Greenhouse Design and Construction:** proficient in designing, selecting materials for, and constructing greenhouse structures suitable for horticultural crop production, considering factors like orientation, ventilation, and structural integrity.
2. **Growing Media and Substrates:** capable of selecting appropriate growing media or substrates, as well as understanding their properties, composition, and irrigation requirements for different horticultural crops.
3. **Nutrient Management:** know how to formulate nutrient solutions, design fertigation systems, and manage nutrient schedules to ensure optimal plant nutrition in controlled environments.
4. **Pest and Disease Management:** skilled in implementing integrated pest management (IPM) and disease management strategies specific to protected cultivation, including biological control methods and sanitation practices.
5. **Water Management:** understand water management principles, including irrigation techniques, water recycling, and drainage systems, to efficiently use and conserve water resources.

## **Work experience/training [aoc]**

### **BAT3S04-Cultivation of vegetable**

To understand the sustainable cultivation aspects of vegetable under rain fed condition

## **Semester- IV**

### **BAT4S01- Weed Management and Fodder crop production**

1. To understand the general characters of weeds and their management
2. To acquaint with cultivation of rice, fiber crops, fodder crops, etc

### **BAT4S02-Farm Power and Machinery**

1. Proficient in selecting appropriate farm machinery and equipment based on the specific needs of various agricultural operations, including planting, harvesting, tillage, and transport.
2. Understand the different sources of farm power, including human, animal, and mechanical power, and their applications in agriculture.
3. Possess a strong grasp of fundamental concepts, theories, and terminology related to farm power, machinery, and equipment used in agriculture.

### **BAT4S03 - Livestock Farming**

1. Possess a strong grasp of fundamental concepts, theories, and terminology related to livestock farming, including animal biology, genetics, and behavior.
2. Proficient in selecting appropriate livestock breeds and making breeding decisions to improve herd or flock quality and productivity.
3. Understand the principles of animal nutrition, including the dietary requirements of different livestock species, feed formulation, and nutritional management.
4. Appreciate the importance of animal health and be skilled in disease prevention, detection, and treatment, as well as biosecurity measures to prevent disease spread.
5. Learn about livestock marketing strategies and opportunities for value-added products such as meat processing and dairy products.

### **BAT4G03- Commercial vegetable production**

1. **Crop Selection and Variety Choice:** proficient in selecting appropriate vegetable crops and varieties based on market demand, local climate, and soil conditions.
2. **Seed Selection and Propagation:** understand the importance of seed selection, seedling production, and propagation methods for ensuring a healthy and productive vegetable crop.

3. **Irrigation and Water Management:** appreciate the principles of irrigation, water requirements, and water management practices specific to vegetable crops to ensure efficient water use and conservation.
4. **Nutrient Management:** know how to formulate nutrient management plans, including fertilization strategies and the use of organic amendments, to provide essential nutrients to vegetable crops.
5. Students get idea about the production technology of both tropical vegetables and cool season vegetables.

#### **BAT4S04-INTERNSHIP- Farm Machinery Operation**

1. To acquaint with use of farm machineries in field.
2. To develop skill in setting up of a mechanised Kitchen Garden, Wick irrigation preparation, transplanting trees, nutrient management, water management, and plant protection aspects by allotting each student 5 cent land for setting up of a Kitchen garden

### **Semester - V**

#### **BAT5S01- Landscape designing and indoor gardening**

1. Possess a strong grasp of fundamental concepts, theories, and terminology related to landscape design, including plant selection, spatial planning, and environmental considerations.
2. Understand and design principles such as balance, proportion, rhythm, and unity, and apply them effectively in creating aesthetically pleasing and functional landscapes.
3. Develop planting plans that consider plant spacing, arrangement, and seasonal interest to create visually appealing and ecologically sound landscapes.
4. Proficient in selecting indoor plants based on light conditions, humidity levels, and available space, ensuring healthy growth and aesthetics.
5. Designing indoor gardens that incorporate aesthetic elements, functional placement, and creative plant arrangements within interior spaces.

#### **BAT5S02-Commercial Enterprises**

1. To understand various commercial enterprises in agricultural sector through observation, field visits and presentation.
2. To develop awareness on bee keeping, sericulture and lac culture through observation, field visit and reporting.
3. To develop skill in cultivation of edible mushrooms and to develop skill in dry flower production and bouquet making.



### **BAT5S03- Tissue Culture and Crop improvement**

1. Explain the fundamental principles of plant tissue culture, including plant growth regulators, media preparation, and aseptic techniques.
2. Perform basic tissue culture techniques, such as explant preparation, sterilization, and culture initiation.
3. Analyze the factors influencing the success of tissue culture, including environmental conditions, hormone concentrations, and contamination control.
4. Discuss the importance of genetic variability and genetic transformation in crop improvement.
5. Assess the ethical, environmental, and regulatory aspects of genetically modified crops developed through tissue culture.

### **BOCG501-ENVIRONMENTAL STUDIES**

1. To bring in proper awareness among the students on Environmental Issues
2. To built a pro-environmental attitude and a behavioral pattern in society based on sustainable lifestyles
3. To impart basic knowledge on pollution and environmental degradation.

### **BAT5G02- Principles of Agribusiness Management**

1. To familiarize with the fundamentals of information and communication management.
2. To understand entrepreneurship strategies.

### **BAT5G03-Fundamentals of organic farming**

1. To familiarize with the concept of sustainability and sustainable development.
2. To acquaint with the fundamentals of organic farming.
3. To have the knowledge about the organic certification procedures
4. To familiarize with the production and utilization of biofertilizers and biocontrol agents

### **BAT5S04 -WORK EXPERIENCE [AOC]**

#### **Organic farming**

1. To acquaint with organic cultivation of vegetables
2. To acquaint with aquaculture with high density fish farming

## **Semester - VI**

### **BAT6S01-Agro Meteorology**

1. Understand the fundamental principles of meteorology, including the components of the Earth's atmosphere, weather phenomena, and climate patterns.
2. Analyze the role of meteorological factors such as temperature, precipitation, humidity, wind, and solar radiation in agriculture.
3. Evaluate the impact of weather and climate variability on crop growth, development, and yield.
4. Interpret weather data and climate information to make informed decisions related to planting, harvesting, and pest management in agriculture.
5. Apply meteorological tools and technologies, including weather forecasting models and remote sensing, to improve agricultural practices.

### **BAT6S02 - Information technology and networking for agriculture**

1. Understand the relevance and significance of information technology (IT) and networking in modern agriculture.
2. Describe the basic principles of computer systems, software, and hardware as they apply to agriculture.
3. Analyze the role of IT and networking in various agricultural domains, including precision agriculture, smart farming, and supply chain management.
4. Evaluate the benefits and challenges of integrating IT solutions, such as sensors, drones, and IoT devices, into agricultural operations.
5. Demonstrate proficiency in using software applications for data collection, analysis, and visualization in an agricultural context.

### **BAT6S03 -Disease Management in Commercial Crops**

1. Identify and classify common plant diseases that affect commercial crops, including fungi, bacteria, viruses, and nematodes.
2. Understand the principles of plant disease epidemiology, including disease cycles, modes of transmission, and factors contributing to disease outbreaks.
3. Evaluate the economic and ecological impact of plant diseases on commercial crop production.
4. Analyze the host-pathogen-environment interactions that influence disease development and severity.

5. Demonstrate proficiency in disease diagnosis, including symptom recognition and laboratory techniques for disease confirmation.

### **BOCG601 - Entrepreneurship Development**

1. Define entrepreneurship and explain its importance in the global economy.
2. Identify personal entrepreneurial traits and assess their own entrepreneurial potential.
3. Generate, evaluate, and refine business ideas, recognizing opportunities in various industries and sectors.
4. Develop a comprehensive business plan, including a mission statement, goals, strategies, and financial projections.
5. Understand the various forms of business ownership, including sole proprietorship, partnership, and incorporation, and choose the most appropriate structure for their venture.

### **BAT6G02-Government Policies and Programmes related to Agriculture**

1. To acquaint with various Government Policies related to Agriculture in Kerala and India.
2. To familiarise with five year plans and Panchayathiraj system in India.

### **BAT6G03-Farming System Approach for Sustainable Crop Production**

1. Define the concept of a farming system and explain its importance in modern agriculture.
2. Understand the principles of sustainable agriculture and their application to crop production.
3. Analyze the components of a farming system, including crops, livestock, soil, water, and socio-economic factors.
4. Evaluate the role of biodiversity in farming systems and its contribution to pest control and soil fertility.
5. Design and implement crop rotations, intercropping, and agroforestry systems to improve soil health and nutrient cycling.

### **BAT6S04- INTERNSHIP - Project and Dissertation**

Industrial training will be conducted at the industrial premises engaged in agriculture and allied activities. A group of students (5-6 numbers) will be allotted to each industry. The interest of the students will be one of the major criteria in selecting the category of industry. A project report of the industrial training shall be submitted at the end of sixth semester and a viva-voce will be conducted by a panel of three subject experts.