

## Department of Agriculture and Food Processing

### B. Sc. (Agriculture) Hons.

#### Programme Outcomes

- ❖ To able to demonstrate critical thinking and problem solving skills as they apply to a variety of animal and or plant production systems.
- ❖ To provide the sound knowledge in the Agriculture and allied science subjects required to solve common problems in management of crop cultivation, improvement, livestock rearing and their marketing.
- ❖ To develop a good teaching-learning environment for higher studies and help in selection of professional careers in government and private organization, agro- based industries, educational/ research/extension, institutes etc.
- ❖ To develop the skills for leadership, ethical integrity, and professional engagement in agriculture and allied science.
- ❖ To provide adequate information about natural and other resources through a course curriculum for the betterment of life.
- ❖ To produce highly skilled professionals in field of various branches of agriculture to meet the need of various scientific agriculture institutions as well as farmers demand for agriculture professionals.
- ❖ To demonstrate research based knowledge of the legal and ethical environment impacting agriculture organizations and exhibit an understanding and appreciation of the ethical implications of decisions.
- ❖ To understand how all aspects of agriculture combine and are used by scientists, marketers, producers and understand how employer characteristics and decision-making at various levels enhance the success of an agricultural enterprise.

#### **After completing the course the students will be able to:**

- To provide highly skilled training in seed production and process, post harvest handling and value addition of horticultural crops, integrated agriculture management, livestock and agricultural mechanization, protected cultivation, mushroom training and composting.
- To develop skill through extension activities that help students to get aware of agricultural field issues of farmers and develop understanding about agriculture by learning practices.
- Understand the basic knowledge of agriculture and related subjects in the current scenario of Indian and world Agriculture.
- Develop an understanding of communication methods, resources utilization, cultivation of crops, management of crops, and value addition of agricultural produces.

- Develop the skills to manage agricultural farms, enhance quality of farm- produces and their commercial utilization.
- Demonstrate the methods used in collection, presentation of data and analysis of results of experiments in laboratories and fields and their validation.
- Understand all related methods in agriculture to increase the profit from crop fields and livestock.
- Learn to make optimum decision at various levels that enhances the success as an agricultural enterprise.
- Extension activities in agriculture and allied sectors around the local villages through Rural Agricultural Work Experience and Agro-industrial Attachment (RAWA & AIA).
- Harmonize the relation with Agriculture Research Institutions, State Agriculture Universities, Krishi Vigyan Kendra (KVK), etc.
- Motivate for entrepreneurship, start-up through project planning and execution, research and training during field visits etc.
- To demonstrate and understanding of the appreciation for the importance of the impact of globalization and diversity in agriculture.

## Course Outcomes of B.Sc. (Hons.) Agriculture

Semester-I		
Subject Code	Subject title	Subject Outcome
AGRB 1101C	Fundamental of horticulture	<ul style="list-style-type: none"> <li>• Educate about the concepts of horticulture; importance and scope, botanical classification of horticultural crops; climate and soil, and propagation methods of different horticultural crops etc.</li> <li>• Describe the various principles and methods of training and pruning, kitchen gardening, basic principles of orchard establishment, unfruitfulness etc.</li> <li>• By the end of this course students will be able to critically evaluate the information related to horticulture as being scientifically based or opinion based and contribute to the knowledge based information.</li> <li>• Analyze the various problems with horticulture crop Production</li> </ul>
AGRB 1103C	Fundamental of soil science	<ul style="list-style-type: none"> <li>• Familiarize the students with different concepts of soil, classification and soil of India.</li> <li>• Understand the soil organism, organic matter and soil pollution.</li> <li>• Develop the skills of soil sampling techniques and sampling tools.</li> <li>• Students learn about physical and chemical properties of soil and their effect on plant's health.</li> <li>• To aware the students about causes, effects and remedies to prevention and mitigation of soil pollution.</li> <li>• To knowledge about soil forming rocks and minerals, their weathering and soil forming processes and climatic factors affect them.</li> </ul>
AGRB 1106C	Fundamental of Agronomy	<ul style="list-style-type: none"> <li>• Discuss about the agronomy, fertilizer, organic manures, agricultural tools, horticultural crops; use of iron and</li> </ul>

		<p>steel in agriculture.</p> <ul style="list-style-type: none"> <li>• Identify the different agricultural tools, fertilizers, seeds, and weeds.</li> <li>• Operate the agricultural tools in the field.</li> <li>• Differentiate the fertilizers, manure &amp; bio-fertilizers.</li> </ul>
AGRB 1104C	Introduction to Forestry	<ul style="list-style-type: none"> <li>• Educate about the importance of trees in agriculture, forest regeneration, forest mensuration, agro-forest; factors affecting standing trees in forest and plantations; salient features of Indian Forest Policies, forest management, forest resources and produce, forest cover in India and in different states, social life and environmental issues, etc.</li> <li>• Develop the understanding of methods used in forest regeneration, land recreation, nursery and forest management, silvicultural practices, collecting of non-timber forest products, etc.</li> <li>• Develop the skills in nursery preparation of forest trees, tending operations, forest mensuration, selection of trees in agro-forestry, etc.</li> <li>• Develop the ability to measure plant and tree growth, volume of felled and standing trees, age of trees, natural and artificial regeneration, basal cover of forests, etc.</li> </ul>
AGRB 1102C	Biochemistry & Bio Tech.	<ul style="list-style-type: none"> <li>• Educate the outlines of bio-molecules, metabolic pathways, morphology and anatomy of living cells.</li> <li>• Develop the understanding of energy synthesis, hereditary mechanisms, enzymatic reactions, cellular function and growth, molecular tests, etc.</li> <li>• Develop the skills for applying principles and methods biochemistry and biotechnology to understand plant growth and metabolisms.</li> <li>• Develop the ability to apply advance techniques for standardization of biochemical processes in plants,</li> </ul>

		optimize cell and tissue growth and culture plant cell and tissue in the laboratory.
AGRB 1110T	Agriculture Heritage	<ul style="list-style-type: none"> <li>• Understand the relevance of heritage in agriculture.</li> <li>• Understand the scope of agriculture in future.</li> <li>• Develop the skills on philosophical and technical difference between historical and scientific agriculture</li> <li>• Develop an evaluative thinking on the facts and information about agricultural history</li> </ul>
AGRB 1107T	Rural Sociology Education Psychology	<ul style="list-style-type: none"> <li>• After completing of the course the students will be able to acquaint the knowledge on various aspects related to rural society, nature and structure of Indian rural society, social stratification, social institution, cultural concept, meaning and significance of agricultural extension and social groups.</li> <li>• Develop understanding on the significance of culture for the society, connotation of personality in the corporate/professional world, learning attitude and self-motivation.</li> <li>• Develop the personality of the students for the professional world, self-assessment, learn rectification and improvement.</li> <li>• Develop the evaluative thinking on need of soft skills (self- motivation, learning attitude, positive attitude, aspiring thoughts) while improvising oneself. Analyzing attitude on rural society, nature and structure of rural society and components of rural society.</li> <li>• Analyze the salient features of Personality and Learning.</li> <li>• Evaluate intelligence, motivation, various theories of motivation</li> </ul>
AGRB 1108C	Introductory Biology	<ul style="list-style-type: none"> <li>• Educate the basics terms describe life and its basic characteristics, taxonomy, evolution, eugenics, etc.</li> <li>• Develop the understanding of plant morphology, vital metabolisms of the cell, system of organizations,</li> </ul>

		<p>reproduction and seed germination, role of forest trees and animals in agriculture, etc.</p> <ul style="list-style-type: none"> <li>• Develop the skills in mounting samples of plant and animal cell/tissue microscopy, identification and classification of plants and animals, categorization of inflorescence, flower and fruits, etc.</li> <li>• Develop ability to differentiate characters of Brassicaceae, Fabaceae, Poaceae and other families of plants.</li> <li>•</li> </ul>
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**Semester -II**

AGRB 1201C	Fundamental Genetics	of	<ul style="list-style-type: none"> <li>• explain with concepts, scope, and importance of genetics in the field of agriculture</li> <li>• Develop the understanding of Mendelian principles and their significance in heredity and inheritance of Qualitative &amp; Quantitative traits</li> <li>• To interpret the process and purpose of cell division, linkage, crossing over, gene interaction, sex determination, and blood group genetics</li> <li>• To analyze the possible genotypes that could occur in an offspring, according to the genotype of the two parents with help of Probability and Chi-square test.</li> </ul>
AGRB 1202C	Agriculture Microbiology		<ul style="list-style-type: none"> <li>• explain with basic terms of microorganisms, prokaryotic and eukaryotic microbes, microbial growth, pure culture, microbial association, soil fertility, symbiotic, associative and asymbiotic of microbes, bio-fertilizers, bio- pesticides, bio-degradation, etc.</li> <li>• Develop the understanding of the role of microbes in soil fertility, crop production and human welfare.</li> <li>• Develop the skills in utilization of various</li> </ul>

		<p>methods, equipment, laboratory tools, glassware, etc. for isolation, identification, preservation, classification and utilization of useful microbes.</p> <ul style="list-style-type: none"> <li>• Develop the ability to differentiate useful, virulent and non-useful microbes.</li> </ul>
AGRB 1203C	Soil & Water Cons. Engg.	<ul style="list-style-type: none"> <li>• Learn the soil and water conservation techniques and provide knowledge about soil erosion, their causes and agents.</li> <li>• Develop the knowledge about water erosion, Gully classification, their control and soil loss measurement techniques.</li> <li>• Develop the knowledge and understanding of the mechanical measure for controlling soil and water erosion.</li> <li>• Develop the skills about water harvesting, their techniques, wind erosion and their control.</li> <li>• Student learn about soil and moisture conservation techniques and reclamation of degraded agricultural land.</li> </ul>
AGRB 1204C	Crop Physiology	<ul style="list-style-type: none"> <li>• Develop an ability to identify C3, C4 and CAM plants, analyze the physical and chemical factors regulate plant growth, evaluate visual symptoms of nutrients deficiency in plants, etc.</li> <li>• Develop the understanding of mechanisms of various metabolic processes in plants - Photosynthesis, respiration, fat metabolism, plant growth, nutrient absorption, etc.</li> </ul>
AGRB 1205T	Agri. Economics	<ul style="list-style-type: none"> <li>• Identify elements of business success in agriculture and food-processing as well as elements that determine economic role of agriculture in national economy.</li> <li>• Propose methods of micro- and macroeconomic decision making in agriculture in different agro-</li> </ul>

		ecological and agro-economic circumstances.
AGRB 1206C	Fundamental of Plant Pathology	<ul style="list-style-type: none"> <li>• Student will acquaint about concepts of plant pathogens, major disease causing organisms and their etiology.</li> <li>• To provide specific knowledge about host pathogen interactions. Recognition of plant disease is the first step in doing something about them.</li> <li>• To give specific knowledge about environment and disease development.</li> </ul>
AGRB 1207C	Fundamental of Entomology	<ul style="list-style-type: none"> <li>• To be able to identify morphological characteristics, feeding habit and habitat of agriculturally important insect-pest.</li> <li>• To be able to apply concepts and analytical approaches in evolutionary biology, genetics and other areas of insect biology of the student's choice.</li> </ul>
AGRB 1208C	Fundamental of Agricultural Ext. Education	<ul style="list-style-type: none"> <li>• Skilled about concept and principle of Extension education their application at village, the, and district level</li> </ul>
<b>Semester-III</b>		
AGRON 201	Crop Production Tech-I Kharif Crops	<ul style="list-style-type: none"> <li>• Students are skilled about concept and principles of Crop Production Technology.</li> <li>• Students will be able to know about origin, geographical distribution, and economic importance, soil and climatic requirements, varieties, cultural practices and yield of Rabi crops.</li> </ul>
GPB 201	Fundamental of Plant Breeding	<ul style="list-style-type: none"> <li>• List out various contribution, the significance of plant breeding and its milestone in the field of agriculture</li> <li>• Develop the understanding about modes of selection, the evolution of crops, conservation of</li> </ul>



		<p>genetic resources, population genetics and significance of IPR in crop improvement</p> <ul style="list-style-type: none"> <li>• plan the breeding objectives and implementation of different selection methods and hybridization techniques for various field crop</li> <li>• Distinguish the breeding method for self, cross and asexually propagated crops.</li> <li>• Students skilled about concept and principle of breeding and their application to develop variety. Identify sources of genetic variation to conduct breeding programme.</li> <li>• To identify characteristics of self and cross pollinated plants. Appreciate the issues associated with breeding plants in commercial setting.</li> <li>• To understand the application of conventional breeding and gene technology approaches in breeding programmes.</li> </ul>
ECO 201	Agricultural Finance & cooperation	<ul style="list-style-type: none"> <li>• Explain the broad feature of Indian financial institutions with instruments to control credit in the country.</li> <li>• To apply economics principles to understand the conduct and performance of the agricultural industry.</li> </ul>
AGRI-ENG 201	Farm Machinery & Power	<ul style="list-style-type: none"> <li>• Students Skilled about concept and principle of Mechanization and their application to develop new technology for smooth completion of agri field work.</li> </ul>
HORT 201	Production Tech. for Vegetable & spices	<ul style="list-style-type: none"> <li>• Students skilled practical knowledge on production techniques of vegetables and spices, Importance in human nutrition and national economy, quality requirement and managing skill for solving field problems.</li> </ul>
LPM 201	Livestock Poultry	<ul style="list-style-type: none"> <li>• Students learn about to develop and evaluate</li> </ul>

	Mngt.	animal production and management systems by integrating knowledge of animal genetics, nutrition, reproduction, and other relevant disciplines and applying scientific and quantitative reasoning to challenges.
EVS 201	Environmental studies and disaster management	<ul style="list-style-type: none"> <li>Learn about the concepts of natural resources, Food resources, mineral resources, Concept of non Conventional energy resources, types and various applications of renewable resources and current potentials of energy resources. Ecosystem Links between environmental components and their role and types of ecosystems.</li> </ul>
<b>Semester-IV</b>		
AGRON 202	Crop Production Tech-I Rabi Crops	<ul style="list-style-type: none"> <li>Students are skilled about concept and principles of Crop Production Technology. Students will be able to know about origin, geographical distribution, and economic importance, soil and climatic requirements, varieties, cultural practices and yield of Rabi crops.</li> </ul>
HORT 202	Production tech. ornamental crop and LS	<ul style="list-style-type: none"> <li>Students Skilled about to set up business related to ornamental crops and landscaping, to develop effective ideas related to collecting, processing and marketing of ornamental and flower crops and their cultivation practices.</li> </ul>
SOIL 201	Problematic soils and their mangt.	<ul style="list-style-type: none"> <li>To provide knowledge about waste land and problematic soils in India and management of the soils. Knowledge of different reclamation and management practices for the development of the soils. To Understand different factors responsible for saline, sodic and acidic soils and their properties.</li> </ul>
HORT 203	Prod. Tech of fruit and Plantation crop	<ul style="list-style-type: none"> <li>Students are able to know importance of different fruit crops and plantation. Students will understand package of practices for the major</li> </ul>

		crops like mango, banana, guava, lemon, pineapple, rubber, tea etc. To understanding the concept of high density planting in different fruit crops.
GPB 203	Principles of Seed tech.	<ul style="list-style-type: none"> <li>• explain with scope and importance of seed technology in agriculture and the role of officials and legislation, seed act and seed order in quality seed production</li> <li>• Develop an understanding of various seed production techniques for different field crops, the importance of maintenance of purity of crop varieties, and factors causing deterioration of variety.</li> <li>• Execution of various phases of seed certification, field inspection, and seed purity testing</li> <li>• Analyze the factors related to genetic and physical purity of seed and its health status of seeds of a variety during seed processing.</li> </ul>
AGRON 203	Farming system and sustainable agriculture	<ul style="list-style-type: none"> <li>• The students will be able to explain the major aspects of agricultural practices and traditions, the relationships among culture, economics, politics, science, and agricultural development and to minimize agricultural pollution and sustain food production.</li> </ul>
ECO 202	Agri- Marketing trade & prices	<ul style="list-style-type: none"> <li>• Students Skilled about concept and principle farm planning budgeting and marketing</li> </ul>
AGROMET 201	Introductory Agro-meteorology and climate change	<ul style="list-style-type: none"> <li>• To understand roles of agrometeorology in agriculture and its relation to other areas of agriculture to acquaint with recent developments in agrometeorology with historical development of climate change.</li> <li>• Agrometeorology or Agricultural meteorology studies meteorological and hydrological factors in</li> </ul>

		relation to agriculture.
<b>Semester –V</b>		
PATH 301	Diseases of horticultural crops and their management	<ul style="list-style-type: none"> <li>• Students Skilled about concept and principle of Diseases of horticultural crops and their Management</li> </ul>
HORT 301	Production tech. ornamental crop and LS	<ul style="list-style-type: none"> <li>• Students Skilled about concept and principle of Production tech. ornamental crop and LS and economical importance</li> </ul>
FSM 301	Principles of food science and PHT	<ul style="list-style-type: none"> <li>• Student will learn food nutrient concept and post harvest handling of fruit and crops and food safety</li> </ul>
EXT 301	Fundamentals of agricultural extension	<ul style="list-style-type: none"> <li>• Students Skilled about concept and principle of extension education activity community development programme</li> </ul>
GPB 301	Crop improvement	<ul style="list-style-type: none"> <li>• Remember the evolutionary history of important field crops along with their centre of origin, its wild species and wild relatives that can be utilized in crop improvement</li> <li>• Develop the understanding of germplasm conservation, utilization, and genetics of qualitative and quantitative characters, and their inheritance.</li> <li>• Analyze breeding procedures and methods breeding objectives in different crop important for the development of improved varieties</li> </ul>
BIOT 301	Introduction to biotechnology	<ul style="list-style-type: none"> <li>• Students Skilled about concept and bio technique and tissue culture, media preparation</li> </ul>
<b>Semester-VI</b>		
PATH 302	Integrated pest and disease management	<ul style="list-style-type: none"> <li>• Student will know the common pests and pathogens of different diseases.</li> <li>• Student acquire the knowledge about etiology, and symptoms of these diseases which helps in diagnosis of the diseases of field and horticultural crops By knowing means of dispersal of these</li> </ul>

		<p>diseases suitable management methods can be applied.</p> <ul style="list-style-type: none"> <li>Eco-friendly and economically suitable management practices may be adopted.</li> </ul>
HORT 302	Post harvest management of horticultural crops and value addition	<ul style="list-style-type: none"> <li>Students understand the post harvest technology and value addition of horticultural crops, work space, tool and equipment design for PHT and value addition.</li> <li>To study the various certification and accreditation i.e. FPO, ISO and other leveling.</li> </ul>
FOOD 301	Dairy technology	<ul style="list-style-type: none"> <li>Students learn about milk processing and milk products.</li> <li>About milk adulteration and quality improvement.</li> <li>Packaging and marketing of milk products.</li> </ul>
AGRON 301	Principles of organic farming	<ul style="list-style-type: none"> <li>Students learn about production techniques of organic farming and certification procedure.</li> <li>To identify the health, environment and economic benefits of organic farming</li> </ul>
COMP 301	Computer applications in agriculture	<ul style="list-style-type: none"> <li>Learn about the use of Decision support systems, Agriculture Expert System and Soil Information Systems in Agriculture.</li> </ul>
SOIL 301	Analytical techniques in soil, plant, fertilizers and water	<ul style="list-style-type: none"> <li>To determine the level of availability of nutrients in soil, plant and water.</li> <li>To predict the increase in yield and profitability of fertilization</li> </ul>
HORT 301	Production technology of spices, plantation, medicinal and aromatic plants	<ul style="list-style-type: none"> <li>Students learn about the use of medicinal and aromatic herbs sustainably. To set up business related to medicinal, aromatic and landscaping. To develop effective ideas related to cultivation practices, processing and marketing herbal natural sources.</li> </ul>
<b>Semester-VII</b>		
PATH-401	Mushroom cultivation	<ul style="list-style-type: none"> <li>Students learn about the various cultivation</li> </ul>

		techniques and practices for mushroom cultivation. They are able to plan and manage mushroom farming at commercial level.
ENTO 401	Apiculture, sericulture, pisciculture and lac culture	<ul style="list-style-type: none"> <li>• Students can adopt apiculture, sericulture and lac culture as an entrepreneur according to agro climatic zone. To understand commercial methods of rearing, equipment, seasonal management, insect pest and disease and important species for commercial use of honey bee, silkworm and lac insect. Identification of different bio control agents (Predator, Parasite and Parasitoids) and their use for sustainable pest management.</li> </ul>
ABM 401	Agri-business Management	<ul style="list-style-type: none"> <li>• Students learn about the analysis of business environment in order to identify business opportunities, Specify the basic performance indicators of entrepreneurial activity.</li> </ul>
AGRON 401	Principles and practices of weed management	<ul style="list-style-type: none"> <li>• Students learn about why to undertake environmental weed control, different approaches of weed management, harmful and beneficial effects of weeds in Agriculture. Students will be acquainted planning for weed management and weed management processes.</li> </ul>
AGRON 402	Farming system and sustainable agriculture	<ul style="list-style-type: none"> <li>• The students will be able to explain the major aspects of agricultural practices and traditions, the relationships among culture, economics, politics, science, and agricultural development and to minimize agricultural pollution and sustain food production.</li> </ul>
AGRON 403	Rainfed farming and watershed management	<ul style="list-style-type: none"> <li>• Study about rain water use for a larger area by suitable watershed management techniques. Conservation of soil by adopting latest soil conservation techniques will help in obtaining higher production of Rainfed crops.</li> </ul>

AGRON 404	Modern concepts in crop production	<ul style="list-style-type: none"> <li>• Students learn about the concept of "doing the right thing in the right place at the right time" has a strong intuitive appeal which gives farmers the ability to use all operations and crop inputs more effectively. More effective use of inputs results in greater crop yield and/or quality, without polluting the environment.</li> </ul>
AGRON 405	Principles and practices of water management	<ul style="list-style-type: none"> <li>• To learn about water resources in India.</li> <li>• To learn about methods and criteria of irrigation in different crops.</li> <li>• To learn about measurement and quality of irrigation water.</li> </ul>
HORT 401	Nursery management of horticultural crops	<ul style="list-style-type: none"> <li>• To supply elite planting material of highest possible quality for establishment of new orchards.</li> <li>• Learn about propagation methods in nurseries.</li> </ul>
HORT 402	Commercial fruit production	<ul style="list-style-type: none"> <li>• To know importance of different fruit crops. Students will understand canopy architecture for higher productivity in mango and grapes. Students will understand package of practices for the major crops like mango, banana, guava, lemon, pineapple etc. To understanding the concept of high density planting in different fruit crops</li> </ul>
HORT 403	Commercial vegetable production	<ul style="list-style-type: none"> <li>• Students skilled practical knowledge on production techniques of vegetables and spices, Importance in human nutrition and national economy, quality requirement and managing skill for solving field problems.</li> </ul>
HORT 404	Commercial floriculture and landscape architecture	<ul style="list-style-type: none"> <li>• Students Skilled about to set up business related to ornamental crops and landscaping, to develop effective ideas related to collecting, processing and marketing of ornamental and flower crops and their cultivation practices.</li> </ul>

HORT 405	Seed production of horticultural crops	<ul style="list-style-type: none"> <li>Learn about supply the disease free seed in the market to get the environment friendly cultivation of horticultural crops. To increase the farm income by producing high yielding disease free quality seed and decrease the cost of cultivation also. Production of hybrid seed of different crops to increase the farm income.</li> </ul>
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**Semester-VIII**

EXT 401	Extension methodologies and communication skills for technology transfer	<ul style="list-style-type: none"> <li>Learn about education, Extension Programme planning Meaning, Process, Principles and Steps in Programme Development. Extension systems in India: Extension efforts in Pre-independence era. New trends in agriculture extension: privatization extension. Monitoring and evaluation – concept and definition, monitoring, and evaluation of Extension programmes, Transfer of Technology- Concept and models.</li> </ul>
AGRON 406	Fertilizer use in crop production	<ul style="list-style-type: none"> <li>To understand essentiality of plant nutrients and mechanism of nutrient transport to plant and factor affecting nutrient availability.</li> <li>To be able about procedure of soil testing and establish soil testing laboratory in future as a entrepreneur.</li> </ul>
AGRON 407	Cropping system	<ul style="list-style-type: none"> <li>To learn about different types of cropping systems according to climatic conditions.</li> <li>To learn about efficient use of all available resources to obtain higher net returns.</li> </ul>
AGRON 408	Water management and micro irrigation	<ul style="list-style-type: none"> <li>To learn about methods and criteria of irrigation in different crops.</li> <li>To learn about measurement and quality of irrigation water.</li> <li>To learn about the installation and management of micro irrigation methods</li> </ul>



HORT 406	Post harvest management of horticultural crops	<ul style="list-style-type: none"> <li>• Students understand the post harvest technology and value addition of horticultural crops.</li> <li>• To learn about work space, tool and equipment design for PHT and value addition.</li> <li>• study the various certification and accreditation i.e. FPO, ISO and other leveling</li> </ul>
HORT 407	Tissue culture and micro propagation techniques in horticulture	<ul style="list-style-type: none"> <li>• Application of plant tissue culture in crop improvement</li> <li>• Tackled the problems in convention breeding.</li> <li>• Plant tissue culture is a area of entrepreneurship.</li> </ul>
HORT 408	Breeding of horticultural crops	<ul style="list-style-type: none"> <li>• Update knowledge on the recent research trends in the field of breeding of fruit crops with special emphasis on tropical, subtropical and temperate crops grown in India.</li> <li>• Evolutionary mechanisms adaptation and domestication, Genetic resource, cytogenetics, cytomorphology, chemotaxonomy, genetics of important traits and their inheritance pattern, variation and natural selection, spontaneous mutations, incompatibility systems in fruits, recent advances in crop improvement efforts- introduction and selection chimeras, apomixes, clonal selection, intergeneric, interspecific and intervarietal hybridization, mutation and polyploidy breeding, resistance breeding to biotic and abiotic stresses, breeding for improving quality, molecular and transgenic approaches in improvement of selected fruit crops.</li> </ul>

## **B.Voc. Food Processing Program Outcome**

- Hand on training to students for skill development and encourage them for becoming entrepreneur in food processing sector which provide a support base for the country's food security.
- To give quality education and training to meet growing demand of food processing industries in addition to pioneering the development of innovative technologies for conservation and process of raw food with value addition.
- To acquire knowledge of emerging /alternative food processing technologies and enable a student to know the relative advantages/disadvantages over existing technologies.

### **Course Outcomes**

	<b>Subject (semester 1)</b>	<b>Course outcome</b>
<b>1.</b>	<b>Introduction to computers</b>	1. Gain knowledge on historical developments and computer peripherals in the operation of computers. 2. Acquire the skills in exploring windows applications in development of documents, data analysis in spread sheet and power point presentation 3. Understand the computer networks in efficient utilization of internet and intranet connection in digital communication. 4. Elicit multimedia presentation focusing on utilization of authorizing tools. 5. Able to apply computer applications in meal management practices and explore the nutritional software and e-journals in professional and academic endeavour.

2	<b>Documentation in food processing</b>	<ol style="list-style-type: none"> <li>1. Students will gain the information about programs needed to inspect raw materials in different food industries.</li> <li>2. Learners will come to know about applications of computer in different food industries.</li> <li>3. Students will learn and practice implementation, life cycle and applications of Enterprise resource planning (ERP).</li> <li>4. Learners will have information about primary, secondary and tertiary packaging.</li> <li>5. Students will perform analysis of data using statistical packages.</li> <li>6. Learners will practice various software used in food industry.</li> </ol>
3	<b>Basics of food processing</b>	<ol style="list-style-type: none"> <li>1. Comprehend the nature and properties of foods</li> <li>2. Understand the principles of the various Food Processing Methods</li> <li>3. Classify the various Foods based on their Structure</li> <li>4. Understand the processing methods of different foods</li> <li>5. Differentiate between Processing of different Food Groups</li> </ol>
4	<b>Dairy Processing</b>	<ol style="list-style-type: none"> <li>1. Understand the processes related to storage, processing and distribution of milk and milk Products.</li> <li>2. Perceive the different properties of milk and milk products.</li> <li>3. Apprehend the thermal processing of milk.</li> <li>4. Grasp the technology of fat rich dairy products.</li> <li>5. Comprehend the technology of condensed milk, dried milk, cheese, yoghurt and indigenous products will be understood.</li> <li>6. Have knowledge regarding hygiene and sanitation practices in the milk and milk products industry.</li> </ol>

	<b>Semester 2</b>	
<b>1</b>	<b>Introductory Food Microbiology</b>	<ol style="list-style-type: none"> <li>1. Acquire the knowledge on the basic concepts of microbes in food and human welfare.</li> <li>2. Relate the theoretical knowledge with microbes in environment.</li> <li>3. Comprehend the knowledge gained on the characteristics of the microorganism in food and apply the techniques to control microbes.</li> <li>4. Understand the relevance of microbial spoilage of various foods and its intoxications</li> <li>5. Provide frame work on the concepts of Quality Control Activities</li> </ol>
<b>2</b>	<b>Basics of food packaging</b>	<ol style="list-style-type: none"> <li>1. Understand the concepts of packaging in terms of history, principle and functions</li> <li>2. Identify the various packaging materials available in the market</li> <li>3. Gain knowledge on the packaging methods and systems</li> <li>4. Enumerate the packaging of different food products</li> <li>5. Ascertain the safety of packages through storage, handling and distribution</li> </ol>
<b>3</b>	<b>Holistic Development I :Personality Development</b>	<ol style="list-style-type: none"> <li>1. Understand the basics of personality, Big five factors and role of Heredity and Environment on human personality</li> <li>2. Determine the levels of personality through theories and assessing oneself and know the implications</li> <li>3. Assess the determinants of personality and apply to life</li> <li>4. Improve and groom one's own personality and to behave in a socially acceptable manner</li> <li>5. Evaluate the causes of personality disorders and provide referral services</li> </ol>
<b>4</b>	<b>Food products Packaging Technology</b>	1:Knowledge about packaging materials

		<p>2: Understanding the types and manufacturing process.</p> <p>3: Understand package testing methods</p> <p>4: Identifying suitable package functions for given product</p>
	<b>Semester 3</b>	
<b>1</b>	<b>Communication skills</b>	<p>Communication skills are to convey your feelings, views, reasons, suggestions, arguments and information to the other person through your words, action and facial expressions. It also includes understanding the same when the other person expresses.</p>
<b>2</b>	<b>Fundamentals of food and nutrition</b>	<p>1. Acquire skill on various methods of assessing nutritional status.</p> <p>2. Relate metabolism of macronutrients with health. 3. Comprehend the functions of micronutrients with health</p> <p>4. Associate knowledge of nutrients with their deficiencies.</p> <p>5. Apply the knowledge in determining the nutritional requirements.</p>
<b>3</b>	<b>Introduction to Grain Milling and Machineries</b>	<p>1. Comprehend the structure and composition of cereals.</p> <p>2. Understand the processes for the preparation of various types of products from cereals.</p> <p>3. Identify suitable equipments required for processing of cereals.</p> <p>4. Comprehend the detailed manufacturing technologies of cereals consumed in daily life in food industries</p>
<b>4</b>	<b>Fundamentals of Food Biochemistry</b>	<p>1. Demonstrate proficiency in understanding physiochemical changes occurring in foods during cooking.</p> <p>2. Explain the properties and reactions of the</p>

		<p>various food components.</p> <p>3. Describe the basic principles and properties of starch proteins, fats and oils, pectic substances and spices and condiments.</p> <p>4. Gain sufficient knowledge about chemistry of starch proteins, fats and oils, pectic substances.</p>
<b>5</b>	<b>Introduction to Cereal and Legume Processing</b>	<p>1. Comprehend the recent advancement in the major cereal grains quality and processing aspects.</p> <p>2. Understand the mechanism underlying the interaction of various flour components and their role in end use quality.</p> <p>3. Grasp the basic and advanced milling methods for wheat, rice, maize.</p> <p>4. Know about by-product utilization of various grains.</p>
<b>6</b>	<b>Environmental &amp; Road Safety Awareness</b>	<p>1. Knowledge on the importance of environment is elucidated</p> <p>2. Understanding on the various principles and relationships between the plants and environment is unraveled.</p> <p>3. Exposure to global issues like pollution and disasters to environment is given.</p> <p>4. Awareness to the save greenery</p>
	<b>Semester 4</b>	
<b>1</b>	<b>Food Spoilage and Control</b>	<p>1 Students will learn about various components of microscope and its principle.</p> <p>2 Students will gain information about spoilage of food by various microorganisms.</p> <p>3 Students will have knowledge about food adulteration.</p> <p>4 Students will evaluate major causes of food spoilage such as various physical, chemical and microbiological.</p>

		<p>5 Students will develop knowledge about bacterial and non-bacterial food born diseases.</p> <p>6 Learners will develop understanding about laboratory orientation and familiarization with various laboratory instruments.</p>
<b>2</b>	<b>Quality Control and Regulations</b>	<ol style="list-style-type: none"> <li>1. Recollect the food safety system and quality attributes.</li> <li>2. Comprehend the knowledge gained on food laws and food safety regulations at regional and national levels.</li> <li>3. Distinguish the role of national and international agencies in establishing food standards.</li> <li>4. Execute Food laws and food safety standards in food service operations.</li> <li>5. Monitor and evaluate food laws and standards in food service industry</li> </ol>
<b>3</b>	<b>Fruits and vegetables processing</b>	<ol style="list-style-type: none"> <li>1. Understand the structure and composition of fruits and vegetables and their role in nutrition.</li> <li>2. Apprehend different operations like cleaning, grading, peeling concentration and different aroma recovery systems.etc involved in processing fruits and vegetables</li> <li>3. Grasp the concept of quality in relation to fruit and vegetable based products.</li> <li>4. Understand the processing and preservation techniques for fruits and vegetables to improve the shelf life.</li> </ol>
<b>4.</b>	<b>Holistic Development II: Physical Training</b>	<ol style="list-style-type: none"> <li>1 Students will develop understanding about sports relationships and sports performance in India.</li> <li>2 Students will gain knowledge about sports injuries and first aid, sports psychology and anxiety.</li> <li>3 Learners will identify and evaluate rules and regulations of different games such as badminton, discuss throw and high jump.</li> </ol>

		<p>4 Learners will perform the measurement and preparation of the field.</p> <p>5 Students will identify different requirements for game such as equipment's, materials and technique.</p>
	<b>Semester 5</b>	
1	<b>Communication skills</b>	<p>Communication skills are to convey your feelings, views, reasons, suggestions, arguments and information to the other person through your words, action and facial expressions. It also includes understanding the same when the other person expresses. Food processing industry depends on the dealing of dealer and consumer to develop the market of product.</p>
2	<b>Entrepreneurship Development in Food Processing</b>	<ol style="list-style-type: none"> <li>1. Understand the forms and practices adopted at business organizations</li> <li>2. Gain knowledge on the various sources of finance and marketing procedures</li> <li>3. Develop competencies in accounting procedures practiced at the organizations</li> <li>4. Compile the financing and entrepreneurial tasks at the food based business</li> <li>5. Encourage Entrepreneurship ventures in food product development and processing Sector</li> </ol>
3	<b>Food industry Waste Management</b>	<p>1 Student will learn about classification &amp; characterization of food industrial waste from dairy, fruit &amp; vegetable processing etc.</p> <p>2 Students will gain information about waste disposal method, economical aspects of waste treatment etc.</p> <p>3 Students will evaluate different treatment methods for liquid waste etc.</p> <p>4 Student will acquire knowledge about treatment methods for solid waste, biogas and effluent</p>



		<p>waste treatment method.</p> <p>5 Learners will conduct experiments to determine BOD and COD of water sample.</p> <p>6 Learners will conduct experiments to find the TDS and TSS.</p> <p>7 Students will prepare flow process chart of food plant waste utilization processes</p>
4	<b>Marketing and Retail Management</b>	<p>1. Apply the principles in product development and design</p> <p>2. Understand the different steps involved in</p> <p>3. Development of food products, testing and evaluation</p> <p>4. Develop entrepreneurship skills in financial and marketing strategies</p>
5	<b>Sugar Processing technology</b>	<p>1 Students will learn about the properties of sugarcane and sugar beet.</p> <p>2 Students will gain information about different sugar production processes.</p> <p>3 Students will develop understanding about the techniques and instruments involved in preparation of different confectionary products.</p> <p>4 Students will prepare or manufacture different sugar products such as coffee, fudge, chewing gum etc.</p> <p>5 Learners will conduct experiments to determine acidity, ash content, and moisture content of sugar products.</p>
	<b>SEMESTER 6 INDUSTRIAL INTERNSHIP</b>	<p>Students works as a trainee in food industry in quality or production unit under the supervision of experts and leans all about quality control and production unit in practical way</p>