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PO, PEO, PSO and CO
of
(Agriculture Sciences)

Dr. Sheelu Rani
(COD)

Dr. Vikas Sharma
(DEAN)

SANT BABA BHAG SINGH UNIVERSITY, KHIALA -1430030, JALANDHAR

Institute Name:	**University Institute of Sciences and Humanities**
Department Name:	**Agricultural Sciences**
Programme Name:	**B.Sc. (Hons.) Agriculture**
Number of Semesters	**8**

Vision:

To be the leading centre to provide quality education in the field of Agriculture, farmer-responsive training and services for the development of Agriculture and Agro- Industry

Mission:

1. To provide relevant education to the students in Processing, Agriculture and life sciences
2. Building expertise through well planned on-field implementation
3. Creating professionals to tackle the dogma from seed to stomach
4. Testing of basic concepts in production, yield enhancement disease resistant and better shelf life of food and flora
5. To disseminate the technology innovation to the producer through integrated extension activities
6. To encourage the youths on entrepreneurship and rural development

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Details of Programme Educational Objectives, Program Outcomes, Program Specific Outcomes

S. No.		Programme Educational Objective (PEO) (The Graduate/Undergraduate will....)
1	PEO1	Imparting detailed knowledge of Agriculture and its allied branches.
	PEO2	Facilitating detailed study of various agriculture forestry, livestock and other allied branches required to raise the income of farmers.
	PEO3	Providing detailed knowledge of agriculture in India and Indian farmers income generating enterprises.
	PEO4	Knowledge dissemination regarding various technique of farming and farming system in India.
	PEO5	Study of market and marketing of agricultural produce.
2	Programme Outcomes (PO) (At the end of Programme/Degree mentioned above, the graduates will be able to .....)	
	PO1.	Fundamental and core knowledge & understanding of agricultural sciences
	PO2.	Transfer relevant knowledge, skills and technology concepts to the producers and to support innovation
	Programme Specific Outcomes (PSO)	
3	PSO1.	Explain the scientific, economic, environmental and business principles underpinning agricultural productivity and production
	PSO2.	Identify and evaluate appropriate agricultural techniques in the crop and animal sectors to enhance efficiency of production and secure long-term food security
	PSO3	Identify and solve technological problems encountered in current crop and livestock production systems
	PSO4	Evaluate the wider consequences of agricultural activities and promote sustainable agricultural practices

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1st Sem

Fundamentals of Horticulture	**AGR101**	CO1	Students will understand the basic horticulture biology, taxonomy, and morphology
		CO2	Students will learn basic horticultural principles and practices
		CO3	Students will learn different methods of propagation used in horticulture.
Fundamentals of Genetics	**AGR103**	CO1	Able to use subject knowledge to under inheritance, linkage, different crosses in plant breeding, mutation.
		CO2	Students will able to calculate the probability of trait transfer from one generation
		CO3	Students will learn about methods of inducing mutations & CIB technique, mutagenic agents and induction of mutation.
Fundamentals of Soil Science	**AGR105**	CO1	Students will be aware about the soil, its types, pedological and edaphological concept, earth spheres, different minerals and rocks existing on earth
		CO2	Students will be aware about soil forming processes and physical properties of the soil
		CO3	Students will understand the economic value of forest and know many of the products they provide to people and society.
Introduction to Forestry	**AGR117**	CO1	Students will able to identify the abiotic and biotic factors in a forest ecosystem
		CO2	Students will able to understand various factors affect tree growth and forest ecosystem development, forest ecology
		CO3	Students will understand the economic value of forest and know many of the products they provide to people and society
Comprehension and Communication Skills in English	**ENG125**	CO1	Students will able to increase their communication skills .
		CO2	Students will able to increase their comprehension skills
		CO3	Students will learn about the preparation of curriculum vitae and job applications and synopsis writing
Fundamentals of Agronomy	**AGR107**	CO1	Students will learn about seeds and sowing, tillage and tilth, crop density and geometry.
		CO2	Students will learn about crop nutrition, manures and fertilizers, nutrient use efficiency and water resources
		CO3	Students will learn about importance, classification of weeds, crop weed competition and concepts of weed management
Introductory Biology	**AGR109**	CO1	Students will able to gain knowledge about biological systems especially plants

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		CO2	Students will learn about diversity and characteristics of life, origin of life, evolution and eugenics
		CO3	Students will learn about binomial nomenclature and classification of cell and cell division
Elementary Mathematics	**MAT107**	**CO1**	Students will able to understand about fundamentals of mathematics being used in agriculture sciences.
		CO2	Students will learn about differential calculus : definition of function, limit and continuity, simple problems on limit, simple problems on continuity .
		CO3	Students will learn about integral calculus : integration of simple functions, integration of product of two functions, integration by substitution method, .
Agricultural Heritage	**AGR111**	**CO1**	Students will understand the agriculture practice and heritage in past .
		CO2	Students will understand the journey of Indian agriculture from past to modern era .
		CO3	Students will learn about importance of agriculture and agricultural resources available in India
Rural Sociology & Educational Psychology	**AGR113**	**CO1**	Students will learn about rural sociology & educational psychology
		CO2	Students will able to communicate with farmer and easily implement the agricultural policies
		CO3	Students will about behavior: cognitive, affective, psychomotor domain, personality, learning, motivation, theories of motivation, intelligence
Human Values & Ethics (non gradial)	**AGR115**	**CO1**	Students will learn about ethic and human values
		CO2	Students will understand the concept of decision making, motivation, sensitivity, success, selfless service
		CO3	Students will learn about principles and philosophy, self exploration, self awareness, self satisfaction
NSS/NCC/Physical Education & Yoga Practices	**PT 101/103/ 105**		Main objective of this subject to make aware the students about national service scheme and involve the students into different activities of NSS/NCC/Physical education and Yoga.

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Agricultural Microbiology	AGR104	CO1	Students will able to apply subject knowledge prokaryotic and eukaryotic microbes,about the biofuel production and biodegradation of agro-waste
		CO2	To gain knowledge about bacterial genetics
		CO3	Students will learn about silage production, biofertilizers, bio pesticides, biofuel production and biodegradation of agro-waste
Introductory Soil and Water Conservation Engineering	AGR106	CO1	Students will learn about the importance of conservation of soil and water
		CO2	Students will identify the degradation of soil's chemical and physical properties
		CO3	Students will understand about different forms of erosion
Fundamentals of Crop Physiology	AGR108	CO1	To understand plant cell structure, organization, and apply specific biochemical functions to all compartments of the plant cell, the process of imbibitions, osmosis, plasmolysis
		CO2	To learn about the plant growth regulators
		CO3	To gain the knowledge about Glycolysis and TCA cycle
Fundamentals of Agricultural Economics	AGR110	CO1	Identify elements of business success in agriculture and foodprocessing
		CO2	Identify elements that determine economic role of agriculture in national economy
		CO3	Recognize biological and economic laws in agricultural production and in decision-making process on agricultural and rural development at micro and macroeconomic level. Recognize biological and economic laws in agricultural production and in decision-making process on agricultural and rural development at micro and macroeconomic level.
Fundamentals of Plant Pathology	ENG112	CO1	Students will know about concept of disease, causal agents of plant diseases
		CO2	Identification of methods and management of crop diseases
		CO3	Students will be able to discuss the main principles and concepts of plant pathology and plant-pathogen interaction
Fundamentals of Entomology	AGR114	CO1	Students will learn about Insect Ecology: Introduction, Environment and its components
		CO2	Students will learn about classification of insecticides, toxicity of insecticides and formulations of insecticides
		CO3	Students will learn about biotype, sub-species, species, genus, family and order

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Fundamentals of Agricultural Extension Education	AGR116	CO1	Fundamentals of Agricultural Extension Education
		CO2	Students will learn about extension efforts in pre-independence and post independence era of rural development
		CO3	They will learn about the extension dministration, monitoring and evaluation, transfer of technology and extension teaching methods
Communication Skills and Personality Development	AGR118	**CO1**	Students will learn about structural and functional grammar; meaning and process of communication, verbal and nonverbal communication
		CO2	Students will about listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures
		CO3	Students will able to understand reading and comprehension of general and technical articles, precise writing, summarizing, abstracting

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6th Sem

Crop Production Technology – I (Kharif Crops)	**AGR201**	CO1	Students will learn the origin, geographical distribution, economic importance of kharif crops
		CO2	Students will learn the soil and climatic requirements, varieties of Kharif crops
		CO3	Students will learn the cultural practices and yield of Kharif crops.
Fundamentals of Plant Breeding	**AGR203**	CO1	Through this course students should be able to students will learn about modes of reproduction and apomixes, self-incompatibility and male sterility- genetic consequences, cultivar options.
		CO2	Students will learn about centers of origin/ diversity, components of Genetic variation; Heritability and genetic advance.
		CO3	Students will able to understand Genetic basis and methods of breeding cross pollinated crops, modes of selection.
Agricultural Finance and Cooperation	**AGR205**	CO1	Students will understand the different credit needs and its role in Indian agriculture, credit analysis, sources of agricultural finance
		CO2	Students will understand how the commercial banks are working, functioning the RRB's, KCC and lead bank scheme, preparing the income statements, balance sheets and project proposal
		CO3	Students will be familiarizing about the different cooperatives working in India.
Agri-Informatics	**CSE231**	CO1	Students will learn about MSOffice for document creation & Editing, Data presentation, interpretation and graph creation, statistical analysis, mathematical expressions
		CO2	Students will learn about Database, concepts and types, uses of DBMS in Agriculture, World Wide Web (WWW)
		CO3	Students will learn about computer models for understanding plant processes
Farm Machinery and Power	**AGR207**	CO1	Students will learn about different components of I.C. engine, I.C. engine terminology and solved problems.
		CO2	Students will learn about air cleaning, cooling, lubrication, fuel supply and hydraulic control system of a tractor
		CO3	Students will learn about primary and secondary tillage implement and Implement for hill agriculture
Production Technology for Vegetables and Spices	**AGR209**	CO1	Understand and analyze the factors that affect the distribution of the industry at the global to regional levels, from small community and roof-top gardens to large acreage, commercial production for local consumption, processing and export.
		CO2	Understand and analyze the factors that affect the distribution of the industry at the global to regional levels, from small community and roof-top gardens

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			to large acreage, commercial production for local consumption, processing and export.
		CO3	Students will understand the challenges and opportunities facing the vegetable industry in the 21st Century.
Environmental Studies and Disaster Management	AGR211	CO1	Students will learn about environmental studies.
		CO2	Students will learn about natural disasters and their management.
		CO3	Students will learn about biodiersity and its conservation.
Statistical Methods	**MAT209**	CO1	Students will learn about the basics of statistic and its use in agriculture.
		CO2	They will learn how to represent the graphical data of their analysis.
		CO3	They will learn about the various central tendencies and dispersion.
Livestock and Poultry Management	**AGR213**	CO1	Students will learn about the management of live stocks.
		CO2	Students will learn about the management of poultry.
		CO3	Students will learn about prevention (including vaccination schedule) and control of important diseases of livestock and poultry

Production Technology for Ornamental Crops, MAPs and Landscaping	AGR204	CO1	Students will be able to identify different types of ornamental and medicinal crops
		CO2	Student will be able to planned and layout of garden
		CO3	Students will be able to do intercultural operations in flowers and medicinal and aromatic crops
Renewable Energy and Green Technology	AGR206	CO1	Students will learn the environmental aspects of non-conventional energy resources
		CO2	Students will know the need of renewable energy resources and latest developments
		CO3	Students will acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles and applications
Problematic Soils and their Management	AGR208	CO1	Demonstrate fundamental knowledge to identify problematic soils and associated problems
		CO2	To identify processes resulting in deterioration of soil physical and chemical properties
		CO3	To use the fundamentals of soil science disciplines for the reclamation of degraded soils
Production Technology for Fruit and Plantation Crops	AGR210	CO1	Students will be able to accurately describe the supply chain of horticultural crops, including world and Indian production; peak industry bodies; industry programs; areas of priority
		CO2	Students will be able to accurately describe a wide range of tropical and dryand horticultural crops
		CO3	Students will be able to accurately describe a wide range of plantation crops
Principles of Seed Technology	AGR 212	CO1	Students will able to perform basic seed quality tests
		CO2	Students will able to perform basic seed quality tests
		CO3	Students will Gain knowledge on biological and technological aspects of seed production
Farming System and Sustainable Agriculture	AGR214	CO1	To provide maximum possible return and profitability
		CO2	To provide an opportunity to increase economic yield
		CO3	To ensure optional utilization and conservation of available resources
Agricultural Marketing, Trade and Prices	AGR216	CO1	Students will learn about the agriculture marketing, trades and prices
		CO2	Students will learn about the agriculture marketing, trades and prices

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		CO3	Students will understand role of Govt. in agricultural marketing: Public sector institutions- CWC, SWC, FCI, CACP & DMI – their objectives and functions
Introductory Agrometeorology & Climate Change	AGR218	**CO1**	To introduce agrometeorology (definitions, aims, scope and importance)
		CO2	To understand roles of agrometeorology in agriculture and its relation to other areas of agriculture
		CO3	To acquaint with recent developments in agrometeorology with historical developments

Principles of Integrated Pest and Disease Management	AGR301	CO1	Students will learn the importance of studying the disease cycles
		CO2	Students will learn different types of symptoms during infection by various types of pathogens and the role of weather and disease forecasting before the spread of epidemics
		CO3	Students will learn prevention and control measures during the disease spread, disease cycle and integrated pest managements in cereal and millet, major oil crops, legumes and other miscellaneous crops
Manures, Fertilizers and Soil Fertility Management	AGR303	CO1	Students will be aware about the management of manures, its applications and composition and different methods for its preparation
		CO2	Students will be aware about management of fertilizers, its applications and composition and different methods for its preparation.
		CO3	Students will understand the concept of soil fertility and productivity and how it can be enhanced.
Pests of Crops and Stored Grains and their Management	AGR305	CO1	To learn how to control identify the crop pest and management.
		CO2	Students must be able to understand: the ecological approach to insect pest management
		CO3	Students must be able to understand chemical control using conventional insecticides; managing stored grains pest
Diseases of Field & Horticultural Crops & their Management-I	AGR307	CO1	Students will learn the importance of studying the disease cycles
		CO2	Students will learn different types of symptoms during infection by various types of pathogens and the role of weather and disease forecasting before the spread of epidemics
		CO3	Students will learn prevention and control measures during the disease spread, disease cycle and integrated pest management of horticultural crops
Crop Improvement – I (Kharif crops)	AGR 309	CO1	Students will learn about modes of reproduction and apomixes, self-incompatibility and male sterility- genetic consequences, cultivar options
		CO2	Students will learn about centers of origin/ diversity, components of Genetic variation; Heritability and genetic advance
		CO3	Students will able to understandgGenetic basis and methods of breeding cross pollinated crops, modes of selection
Entrepreneurship Development and Business Communication	AGR311	CO1	Student will able to know the parameters to assess opportunities for new besiness ideas
		CO2	Students will able to design strategies for successful implementation of ideas
		CO3	Students will able to build the possibility of entrepreneurship development
Geoinformatics, Nano-	AGR313	CO1	Students will learn about the agriculture marketing, trades and prices

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technology and Precision Farming		CO2	Students will learn about the agriculture marketing, trades and prices
		CO3	Students will understand role of Govt. in agricultural marketing: Public sector institutions- CWC, SWC, FCI, CACP & DMI – their objectives and functions
Practical Crop Production-I (Kharif Crops)	AGR315	**CO1**	Students will learn field preparation, seed treatment, nursery raising, sowing, nutrient management, water management, weed management
		CO2	Students will learn management of insect pests and diseases of crops harvesting, threshing, drying, winnowing, storage and marketing of produce
		CO3	Students will learn about preparation of balance sheet including cost of cultivation, net returns per student as well as per team of a group of students
Intellectual Property Rights	AGR317	**CO1**	To impart the skills in intellectual property, GATT, WTO, TRIPs and WIPO, Treaties for IPR protection
		CO2	To impart UPOV for protection of plant varieties, Protection of plant varieties under UPOV and PPV&FR Act of India
		CO3	Students will learn about traditional knowledge-meaning and rights of TK holders

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Rainfed Agriculture and Watershed Management	AGR302	CO1	Students will able to identify the Soil and climatic conditions prevalent in rainfed areas
		CO2	Students will able to understand various water harvesting: importance, its techniques, efficient utilization
		CO3	Students will understand the contingent crop planning for aberrant weather conditions
Protected Cultivation and Secondary Agriculture	AGR304	CO1	Students will able to perform protected cultivation practices
		CO2	Students will able to perform post harvest practices.
		CO3	Students will able to understand types of Green Houses; Plant response to Green house environment
Diseases of Field & Horticultural Crops & their Management-II	AGR306	CO1	Students will learn the importance of studying the disease cycles.
		CO2	Students will learn different types of symptoms during infection by various types of pathogens and the role of weather and disease forecasting before the spread of epidemics
		CO3	Students will learn prevention and control measures during the disease spread, disease cycle and integrated pest management of horticultural crops
Post-harvest Management and Value Addition of Fruits and Vegetables	AGR308	CO1	Students will understand importance and use of processing and value addition of fruits and vegetables
		CO2	Students will identify the post harvest diseases
		CO3	Students will identify the physiological disorders of horticultural crops and perform post harvest practices.
Management of Beneficial Insects	AGR 310	CO1	Students will understand importance of beneficial Insects, beekeeping and pollinators
		CO2	Students will identify diseases of beneficial insect and their management
		CO3	Students will understand the silkworm, voltinism and biology of silkworm. Mulberry cultivation.
Crop Improvement – II (Rabi)	AGR312	CO1	Students will learn centers of origin, distribution of species, wild relatives in different crops
		CO2	Students will learn plant genetic resources, its utilization and conservation
		CO3	Students will learn about major breeding objectives and procedures including conventional and modern innovative approaches for development of hybrids and varieties
Practical Crop Production-II (Rabi Crops)	AGR314	CO1	Students will learn field preparation, seed treatment, nursery raising, sowing, nutrient management, water management, weed management
		CO2	Students will learn management of insect pests and diseases of crops harvesting, threshing, drying, winnowing, storage and marketing of produce
		CO3	Students will learn about preparation of balance sheet including cost of cultivation, net returns per student as well as per team of a group of students

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Principles of Organic Farming	AGR316	CO1	Students will identify and explain the key principles and practices involved in maintaining soil fertility
		CO2	Explain plant productivity and health in organic system
		CO3	Explain the role of livestock and forage production in organic farming systems
Farm Management, Production and Resource Economics	AGR318	CO1	Students will know about concept farm management, objectives and relationship with other sciences.
		CO2	Identification use of production function in decision-making on a farm, factor-product, factor-factor and product relationship
		CO3	Students will be able to discuss Farm business analysis: meaning and concept of farm income and profitability
Principles of Food Science and Nutrition	AGR320	CO1	Students will learn about the food science, food composition and chemistry water, carbohydrates, proteins, fats, vitamins, minerals, flavours, colours, miscellaneous bioactive, important reactions
		CO2	Identification use food microbiology (bacteria, yeast, moulds, spoilage of fresh & processed foods
		CO3	Students will be able to discuss food and nutrition, malnutrition (over and under nutrition), nutritional disorders

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Course Code	AGR220	
Course Title	Commercial Plant Breeding	
Type of course	Theory & Practical	
L T P	1 0 2	
Credits	3 (1+2)	
Course prerequisite	10+2 (Non Medical or Medical) or Equivalent	
Course objective	Main objective of this subject is to familiarize the student about the commercial plant breeding techniques which are used to produce newhigh yielding varieties by the industries	
Course outcomes	CO1	Students will understand the aims and objectives of commercial plant breeding
	CO2	Students will understand principles and techniques of hybrid seed production and registration
	CO3	Students will understand intellectual property rights

Course Code	AGR222	
Course Title	Biopesticides & Biofertilizers	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2+1)	
Course prerequisite	10+2 (Non Medical or Medical) or Equivalent	
Course objective	Main objectives of this subject is to familiarize the students about the biopesticides and biofertilizers which are free from harmful chemicals and more environment friendly and future of the crop production	
Course outcomes	CO1	Students will learn about biopesticides. importance, scope and potential of biopesticides
	CO2	Students will be aware about bio fertilizers its status and scope. characteristic features of various bacterial bio fertilizers.
	CO3	Students will be aware about production technology: Strain selection, sterilization, growth and fermentation, mass productionof carrier

Course Code	AGR224	
Course Title	Protected Cultivation	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2+1)	
Course prerequisite	10+2 (Non Medical or Medical) or Equivalent	
Course objective	Main objective of this subject is to let student learn about protected farming to produce cash and medicinal crops with new and advanced technology.	
Course outcomes	CO1	Students will be aware about the protected cultivation, cladding material involved in greenhouse/ poly house.
	CO2	Students will be aware about the irrigation and fertigation management in polyhouse.
	CO3	Students will understand the concept of cultivation of economically important medicinal and aromatic plants.

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8th Sem

Course Code	AGR226	
Course Title	Micro propagation Technologies	
Type of course	Theory & Practical	
L T P	3 0 2	
Credits	3 (1+2)	
Course prerequisite	10+2 (Non Medical or Medical) or Equivalent	
Course objective	Main objective of this subject is to learn about the tissue culture andmicro propagation technology	
Course outcomes	CO1	Students will be aware about types of cultures (seed, embryo, organ, callus, cell)
	CO2	Students will be aware about Stages of micropropagation, axillary bud proliferation
	CO3	Students will understand the concept of organogenesis (callus and direct organ formation), somatic embryogenesis, cell suspension cultures.

Course Code	AGR319	
Course Title	Hi-tech. Horticulture	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2+1)	
Course prerequisite	10+2 (Non Medical or Medical) or Equivalent	
Course objective	Main objective of this subject is to introduce the students about latest technology in the field of horticulture.	
Course outcomes	CO1	Students will understand nursery management and mechanization; micro propagation of horticultural crops
	CO2	Students will learn basic modern field preparation and planting methods, protected cultivation
	CO3	Students will learn different methods and components of precision farming: Remote sensing, Geographical Information System (GIS)

Course Code	AGR321	
Course Title	Weed Management	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2+1)	
Course prerequisite	10+2 (Non Medical or Medical) or Equivalent	
Course objective	Main objective of this subject is to let learn the student about themanagement of weeds with different technique	
Course outcomes	CO1	Students will able to understand the cycle of weeds and crop weed competition, different methods of weed control
	CO2	Students will understand integrated weed management, classifications and formulations of herbicides
	CO3	Students will identify aquatic and problematic weed and their control

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Course Code	AGR324	
Course Title	Agrochemicals	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2+1)	
Course prerequisite	10+2 (Non Medical or Medical) or Equivalent	
Course objective	Main objective of this subject is familiarize the students about the different types of agro chemicals used in the form of insecticides, pesticides and fertilizers	
Course outcomes	CO1	Students will understand the agrochemicals, their type and role in agriculture.
	CO2	Students will learn about herbicides-major classes, properties and important herbicides.
	CO3	Students will learn different fertilizers and their importance.

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SANT BABA BHAG SINGH UNIVERSITY, KHIALA -1430030, JALANDHAR

Institute Name:	**UISH**
Department Name:	**Agricultural Sciences**
Programme Name:	**M.Sc. Ag. Horticulture (Fruit Science)**
Number of Semetsers	**4**

Vision

1. To develop skilled students with basic and applied knowledge and skills of horticultural crops production & management protection and soil fertility management principles & concepts, fruit breeding
2. Enable the students to understand and realize problems in fruit crop production and seek solutions through exposure to research, extension and management.

Mission

1. To achieve excellence in the curriculum planning pertaining to Horticulture (Fruit Science) by periodically updating it in order to provide the students with sound technical knowledge.
2. To strengthen the research activities in fruit science by undertaking innovative and application oriented projects for the development of Agricultural and allied sectors.
3. Generating knowledge and producing skilled manpower in the field of horticulture
4. Modernizing horticultural crop production sector by supplying it improved technologies i.e. improved seed or planting material, propagation techniques, optimum fertilization, irrigation etc.

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Details of Programme Educational Objectives,Program Outcomes,Program Specific Outcomes

S.No.		Programme Educational Objective (PEO)
1	PEO1.	Train and develop scholars and promote research by providing students with contemporary concepts in various fields of crop Horticulture.
	PEO2.	Generate knowledge through training in cognitive, affective, and psychomotor, which are necessary for productive scholarly research in a selected area of Fruit science
	PEO3	Acquire in-depth knowledge in area(s) of specialization.
	PEO4	The program will contribute to the development of agricultural sector and thereby ensure food security and self-sufficiency.
2		**Programme Outcomes (PO)**
	PO1.	Specific knowledge of various courses specialized to their studies.
	PO2.	Detailed knowledge on the subject to improve the farmer's condition by their contributions.
	PO3	Detailed knowledge of cultivation practices of tropical, subtropical, temperate and arid region fruits, soil, fertilizers insect pest, economic associated with farming enterprises.
	PO4	Use appropriate scientific and statistical methods and evaluations for decision making in various sectors of agriculture.
3		**Programme Specific Outcomes (PSO)**
	PSO1.	Demonstrate use of written and oral communication skills.
	PSO2.	Understanding the basic concepts and theories and terminology of Fruit Science
	PSO3	Undertake teaching, research and offer administrative and consultancy services to organizations.
	PSO4	Apply research and expertise in solving or suggesting solutions to problems in the agricultural industry

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SEMESTER-I

Course Code	**AGR531**	
Course Title	**Tropical and Dry Land Fruit Production**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2 +1)	
Course prerequisite	B.Sc (Agriculture)	
Course objectives (CO)	To impart basic knowledge about the importance and management of tropical and dry land fruits grown in India.	
Course Outcomes	CO1	As with most crops, students will study the growing of these crops including: soils; plant establishment; cropping systems;
	CO2	Student will able to make orchard layout; tree management - pruning and training; nutrition; water management; managing plants in marginal climates
	CO3	Student will be able to know the supply chain of horticultural crops, including world and Indian production

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Course Code	AGR533	
Course Title	**Sub-tropical and Temperate Fruit Production**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	2 +1	
Course prerequisite	B.Sc (Agriculture)	
Course objectives (CO)	To impart basic knowledge about the importance and management of subtropical and temperate fruits grown inIndia	
Course Outcomes	CO1	Student will be able to know cultivation practices a wide range of subtropical and temperate fruit crops
	CO2	Student will able to make orchard layout; tree management - pruning and training; nutrition; water management; managing plants in marginal climates
	CO3	Student will be able to know the supply chain of horticultural crops, including world and Indian production

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COA

Course Code	AGR535	
Course Title	**Biodiversity and conservation of fruit crops**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	2 +1	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	Understanding the principles of biodiversity and strategies in germplasm conservation of fruit crops.	
Course Outcome	CO1	Student will understand the conservation and management strategy for biodiversity in India
	CO2	Student will be able to find out the area with high biodiversity means the area in which number of plants are present. After that this high biodiversity area should be covered in the form of natural park/ sanctuary/biosphere reserve etc. In this way biodiversity can be conserve in their natural habitat from human activities Biodiversity rich areas and hotspots
	CO3	Student will be able to know the plant quarantine procedure

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Course Code	AGR539	
Course Title	**Canopy management in fruit crops**	
Type Course	Theory & Practical	
L T P	1 0 1	
Credits	2(1 +1)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To impart knowledge about the principles and practices in canopy management of fruitcrops	
Course Outcomes	CO1	students will be able to identify plant vegetative structure
	CO2	Students will be able to understand geometry of planting of fruitcrops
	CO3	Students will be able to know canopy management through rootstock andscion.

Course Code	AGR541	
Course Title	**Propagation and Nuresery management for fruit crops**	
Type Course	Theory & Practical	
L T P	2 0 1	
Credits	3(2 +1)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	Familiarization with principles and practices of propagation and nursery management for fruit crops	
Course Outcomes	CO1	Students will be able to propagate fruit crops with various propagation techniques
	CO2	[illegible]
	CO3	Students will be able to understand nursery structures and nursery management

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Course Code	**AGR542**	
Course Title	**GROWTH AND DEVELOPMENT OF HORTICULTURAL CROPS**	
Type Course	Theory & Practical	
L T P	2 0 1	
Credits	3(2 +1)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To develop understanding of growth and development of horticultural crops which have implications in their management.	
Course Outcomes	CO1	Students will be able to understand growth dynamics of plants
	CO2	Students will be understand the biosynthesis of growth regulators
	CO3	Students will be understand molecular and genetic approaches in plant growth development.

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Course Code	MAT529	
Course Title	**Experimental designs**	
Type of Course	Theory	
L T P	2 0 1	
Credits	3 (2 +1)	
Course Prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	Mathematics is really a great tool to understand the things correctly. The aim of the course is to enable students : (1) To understand the theory knowledge as well as practical knowledge of different formulas.(2) To inculcate the skills to use different methods to solve the applied problems.	
Course Outcomes	CO1	Students will understand the theory knowledge as well as practical knowledge of different formulas
	CO2	Analysis of data pertaining to attributes and to interpret the results.
	CO3	Making familiar with some elementary statistical methods of analysis of research data

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Course Code	CSE551	
Course Title	COMPUTER FUNDAMENTALS AND PROGRAMMING	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3(2 +1)	
Course prerequisite	B.Sc (Agriculture)/CSE	
Course Objectives (CO)	To impart comprehensive knowledge about the computer fundamentals and programming	
Course Outcomes	CO1	Students will be able to operate the Sequencing, alteration and iteration, arrays, string processing
	CO2	Students will be able to Computer programming Fundamentals
	CO3	Students will be to do conversion of different number types; creation of flowchart

Course Code	AGR515	
Course Title	Master's Research	
Type of course	Practical	
L T P	0 0 4	
Credits	4 (0 + 4)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcomes	CO1	This program will provide students the thebretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	AGR530	
Course Title	**BREEDING OF FRUIT CROPS**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	2+ 1	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	To impart comprehensive knowledge about the principles and practices of breeding of fruit crops	
Course Outcomes	CO1	Upon completion of this course, student will Apply the basic principles of genetics and plant breeding for genetic improvement of plants
	CO2	Students will be able to use breeding methods for improvement of horticultural crops for quality and yields as per requirements of the growing population
	CO3	Students will able to use various selection techniques and methods that can be used in genetic improvement of self and cross pollinated crops

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Course Code	AGR532	
Course Title	**Biotechnology of Fruits Crops**	
Type of course	Theory	
L T P	2 0 1	
Credits	3(2+1)	
Course prerequisite	B.Sc (Agriculture) or Life Sciences	
Course Objectives (CO)	Understanding the principles, theoretical aspects and developing skills in biotechnology of horticultural crops	
Course Outcomes	CO1	Students will be able to use plant tissue culture techniques
	CO2	Students will be able to understand harnessing bio-technology in horticultural crops
	CO3	Students will be able to know achievements of biotechnology in horticultural crops

Course Code	AGR534	
Course Title	**Organic Horticulture**	
Type of course	Theory	
L T P	1 0 1	
Credits	2(1 + 1)	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	To familiarize procedure and methods of fruit growing & their fundamentals..	
Course outcomes	CO1	Students will be known to certification of organic products and systems, agencies involved at national and international levels, standards evolved by different agencies
	CO2	Students will be known to organic horticulture in quality improvement
	CO3	Students will be known constraints in certification, organic horticulture and export

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Course Code	AGR536	
Course Title	GAP FOR HORTICULTURAL CROPS	
Type Course	Theory & Practical	
L T P	1 0 0	
Credits	1(1 +0)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To impart comprehensive knowledge about the principles and practices of Good Agricultural Practices (GAP) for horticultural crops.	
Course Outcomes	CO1	Students will be to understand Genesis of GAP
	CO2	Students will be to understand IPM, INM, IWM
	CO3	Students will be to know Institutions involved in GAP certification. Indian agencies,

Course Code	AGR538	
Course Title	Climate Management in horticulturalproduction	
Type Course	Theory & Practical	
L T P	1 0 0	
Credits	1(1 +0)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To develop understanding about the impact and management of climate in horticultural production	
Course Outcomes	CO1	Students will be understand to know Sensors for climate registration and crop monitoring
	CO2	Students will be understand to know Impact of climate changes on invasive insect, disease, weed, pests, horticulture yield
	CO3	Students will be understand to know Special protected cultivation

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Course Code	AGR550	
Course Title	**Soil erosion and conservation**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3(2 +1)	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	To study the impact of erosion on soil, water and air quality and how to conserve soil erosion	
Course Outcomes	CO1	To provide knowledge about waste land and problematic soils in India and management of the soils.
	CO2	Knowledge of different reclamation and management practices for the development of the soils.
	CO3	To Understand different factors responsible for saline , sodic and acidic soils and their properties.

Course Code	AGR552	
Course Title	**Soil, water and air pollution**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3(2+1)	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	To study the pollution impact on soil, air & water and its remediation	
Course Outcosme	CO1	To aware the students about causes, effects and remedies to prevention and mitigation of soil pollution
	CO2	Students will be able to know remote sensing applications in monitoring and management of soil and water pollution.
	CO3	Students will be able to know Remediation/amelioration of contaminated soil and water,
Course Code	**BOT522**	
Course Title	Intellectual property and its management in agriculture	
Type of course	Theory	
L T P	2:0:0	
Credits	2(2+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives	To equip students and stakeholders with knowledge of intellectual property rights (IPR) related protection systems, their significance and use of IPR as a tool for wealth and value creation in a knowledge-based economy.	

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Course Outcomes	CO1	Students will be able to understand Historical perspectives and need for the introduction of Intellectual Property Right
	CO2	Students will be able to understand National Biodiversity protection initiatives. Convention on BiologicalDiversity.
	CO3	Students will be able to understand Research collaboration Agreement, License agreement

Course Code	**AGR500**	
Course Title	**Master's Research**	
Type of course	Practical	
L T P	0 0 4	
Credits	4 (0+ 4)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcomes	**CO1**	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	LIB601	
Course Title	**Library and Information Services**	
Type of course	Theory	
L T P	0 0 1	
Credits	1 (0 +1)	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	1. Educate and assist students in the identification and effective useof informationresources 2. Provide current library materials and databases that supportthe academic curriculum	
Course Outcomes	CO1	Students will be able to understand the Role of libraries in University education
	CO2	, Students will be able to understand the sources of information
	CO3	Students will be able to understand the Citation , techniques/Bibliographic control and Preparation of bibliography;

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Course Code	**AGR631**	
Course Title	**Protected cultivation**	
Type of course	Theory &Practical	
L T P	2 0 1	
Credits	3(2+1)	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	Understanding the principles, theoretical aspects and developing skills in protected cultivation of fruit crops	
Course Outcomes	CO1	After completion of this course, the students will acquire basic knowledge about the fundamental aspects of Protected cultivation horticulture
	CO2	Students will able to understand and identify different types of green houses and their importance
	CO3	Students will able to perform protected cultivation practices.

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Course Code	**AGR537**	
Course Title	**Post harvest technology for fruit crops**	
Type Course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2 +1)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To facilitate deeper understanding on principles and practices of post-harvest management of fruit crops.	
Course Outcomes	CO1	On completion of course the students will be able to Understand technologies of post-harvest technology and its role in providing better quality produce to the consumer
	CO2	Understand importance of prevention of losses Understand functional foods and nutraceuticals
	CO3	Students will be aware about the importance of Marketing linkage for fresh produce and processed products

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Course Code	AGR 603	
Course Title	**Master's Seminar**	
Type of course	Practical	
L T P	1 0 0	
Credits	1(1 +0)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcome	**CO1**	Students will demonstrate the ability to collaborate with others as they work on intellectual projects (reading, writing, speaking, researching...).
	CO2	Students will demonstrate the ability to follow discussions, oral arguments, and presentations, noting main points or evidence and tracking threads through different comments.
	CO3	Further, students will be able to challenge and offer substantive replies to others' arguments, comments, and questions, while remaining sensitive to the original speaker and the classroom audience.

Course Code	AGR605	
Course Title	**Master's Comprehensive Exam**	
Type of course	Practical	
L T P	0 0 2	
Credits	2(0 +2)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcomes	**CO1**	It will improve strong analytical, problem-solving and critical thinking abilities
	CO2	Depth knowledge of the discipline.
	CO3	Ability to communicate knowledge of the discipline

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Course Code	AGR601	
Course Title	**Master's Research**	
Type of course	Practical	
L T P	0 0 4	
Credits	4 (0 + 4)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcomes	**CO1**	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Semester IV

Course Code	AGR600	
Course Title	**Master's Research**	
Type of course	Practical	
L T P	0 0 8	
Credits	8(0 + 8)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	AGR602	
Course Title	Technical Writing and communications skills	
Type of course	Practical	
L T P	0:0:2	
Credits	1(0+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives	To equip the students/scholars with skills to write dissertations, research papers, etc. To equip the students/scholars with skills to communicate and articulate in English (verbal as well as writing).	
Course Outcomes	CO1	Students will analyze basic communication skills.
	CO2	Students will be able to understand carious forms of scientific writings
	CO3	Students will analyze intercultural communication skills.

Course Code	AGR604	
Course Title	Human rights and constitutional duties	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives	To study the human rights and its actual status	
Course Outcomes	CO1	By the end of the course students should be able to: Demonstrate a good understanding of the provisions under the Constitution of India dealing with human rights
	CO2	Display a good understanding of the nature and scope of special legislations dealing with protection of human rights of marginalized and vulnerable sections.
	CO3	Demonstrate a good understanding of the practical application of human rights law to specific human rights problems in India.

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Course Code	**AGR606**	
Course Title	Agriculture research, research, ethics and rural development programme	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives	To sensitize the scholars about the basic issues related with agricultural Research, ethics in research as well as rural development.	
Course Outcomes	CO1	Students will understand the standards and problems in research ethics
	CO2	The students should have develop the decision making tools which can be implemented/performed during a critical situation
	CO3	The students become familiar with the typical life of the rural mass and their livelihood patterns.

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SANT BABA BHAG SINGH UNIVERSITY, KHIALA -1430030, JALANDHAR

Institute Name:	**UISH**
Department Name:	**Agricultural Sciences**
Programme Name:	**M.Sc. Ag. (Soil Science and Agriculture Chemistry)**
Number of Semetsers	**4**

Vision:

To develop skilled and efficient human resource in the field of Soil Science and Agriculture Chemistry for imparting education to students, undertaking appropriate research on crop and natural resource management on sustainable basis in the plains, extend knowledge and skill to the farmers.

Mission:

1. To achieve excellence in the curriculum planning pertaining to Soil Science and Agriculture Chemistry by periodically updating it in order to provide the students with sound technical knowledge.
2. To strengthen the research activities in Soil Science and Agriculture Chemistry by undertaking innovative and application oriented projects for the development of Agricultural and allied sectors.
3. To stimulate and nurture student's interest in Soil Science and Agriculture Chemistry and achieve their professional goals
4. To generate, disseminate, integrate and apply knowledge which is vital to society and to provide leadership and service to the nation.

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Details of Programme Educational Objectives, Program Outcomes, Program Specific Outcomes

S. No.		Programme Educational Objective (PEO) (The Graduate/Undergraduate will....)
1	PEO1.	Train and develop scholars and promote research by providing students with contemporary concepts in various fields of Soil Science and Agriculture Chemistry.
	PEO2.	Generate knowledge through training in cognitive, affective, and psychomotor, which are necessary for productive scholarly research in a selected area of Soil Science and Agriculture Chemistry.
	PEO3	Acquire in-depth knowledge in area(s) of specialization.
	PEO4	Undertake independent research and present results in a coherent and comprehensive manner and hence enrich area(s) of scholarship.
2		**Programme Outcomes (PO) (At the end of Programme/Degree mentioned above , the graduates will be able to .....)**
	PO1.	Specific knowledge of various branches specialized to their studies.
	PO2.	Detailed knowledge on the subject to improve the farmer's condition by their contributions.
	PO3	Detailed knowledge of soil physics, soil chemistry, soil microbiology, soil classification, soil fertility and fertilizers and importance of all sciences to the farmers.
	PO4	Use appropriate scientific and statistical methods and evaluations for decision making in various sectors of agriculture.
3		**Programme Specific Outcomes (PSO)**
	PSO1.	Demonstrate use of written and oral communication skills.
	PSO2.	Understanding the basic concepts and theories and terminology of Soil Science and Agriculture Chemistry.
	PSO3	Undertake teaching, research and offer administrative and consultancy services to organizations.
	PSO4	Apply research and expertise in solving or suggesting solutions to problems in the agricultural industry

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SEMESTER I

Course Code	AGR551	
Course Title	**Soil Physics**	
Type of course	Theory and Practical	
L T P	2 :0:1	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To teach the students about physical properties of soil and different processes involved in it.	
Course Outcomes	CO1	Upon completion of this course, student will be able to apply the knowledge about the various physical processes and properties
	CO2	Students will be able to understand soil structure-genesis, types, characterization and management soil structure
	CO3	Students will able to use various techniques used to analyze the physical properties.

Course Code	AGR553	
Course Title	**Soil Chemistry**	
Type of course	Theory and Practical	
L T P	2: 0:1	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To enable the students to understand the various processes occurred during chemical reactions in soil	
Course Outcomes	CO1	Describe the chemical (elemental) composition of the earth's crust and various chemical processes involved in soil
	CO2	Understand the ion exchange processes in soil, cation exchange- theories based on law of mass action
	CO3	Describe the chemistry of salt-affected soils and amendments and chemistry and electrochemistry of submerged soils.

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Course Code	AGR555	
Course Title	**Soil mineralogy, genesis, survey and classification**	
Type of course	Theory and Practical	
L T P	2:0:1	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To study fundamentals of soil mineralogy, genesis, survey and classification.	
Course Outcomes	CO1	Describe the identification techniques, amorphous soil constituents and other non-crystalline silicate minerals
	CO2	Understand the factors of soil formation, soil formation models and soil forming processes.
	CO3	Describe the soil survey and its types, soil survey techniques - conventional and modern

Course Code	AGR557	
Course Title	**Soil biology and biochemistry**	
Type of course	Theory and Practical	
L T P	2 : 0 : 1	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To study the physiochemical properties of soil and its microflora.	
Course Outcomes	CO1	Students will learn about the soil biota, soil microbial ecology, types of organisms in different soils and soil microbial biomass
	CO2	Students will know how the microbial transformations of nitrogen, phosphorus, sulphur, iron and manganese in soil takes place.
	CO3	Students will be able to understand the biodegradation of pesticides, organic wastes and their use for production of biogas and manures.

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Course Code	AGR559	
Course Title	**Radioisotopes in soil and plant studies**	
Type of course	Theory and Practical	
L T P	1 : 0 : 1	
Credits	2(1+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To familiarize the students about the different radioisotopes involved in soil and plant studies	
Course Outcomes	CO1	Students will learn about the atomic structure, radioactivity and units and radioisotopes
	CO2	Students will know how the principles and use of radiation monitoring instruments
	CO3	Students will be able to understand the Isotopic dilution techniques used in soil and plant research

Course Code	AGR561	
Course Title	**System approaches in soil and crop studies**	
Type of course	Theory and Practical	
L T P	2 : 0 : 1	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To familiarize the students with the concept of system, models and simulation of different models and evaluation in different aspects of agriculture	
Course Outcomes	CO1	Students will be aware about the systems concepts - definitions, general characteristics and general systems theory
	CO2	Students will be aware about the model, definition and types- empirical and mechanistic and mathematical models.
	CO3	Students will understand the application of simulation models in understanding system behavior.

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Course Code	AGR563	
Course Title	**Management of problematic soils and water**	
Type of course	Theory and Practical	
L T P	2 : 0 : 1	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To study the physiochemical properties of different problematic soil and water and their management.	
Course Outcomes	CO1	Students will be know about the problem soils – acidic, saline, sodic and physically degraded soils
	CO2	Students will be aware about management of salt-affected soils, salt tolerance of crops-mechanism and ratings
	CO3	Students will understand the quality of irrigation water, management of brackish water for irrigation

Course Code	AGR565	
Course Title	**Fertilizer technology**	
Type of course	Theory	
L T P	1 : 0 : 0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To study about the different manufacturing processes, recent developments and new emerging issues in fertilizer technology.	
Course Outcomes	CO1	Students will understand the fertilizers production, consumption and future projections
	CO2	Students will be aware about manufacturing processes for different fertilizers using various raw materials
	CO3	Students will be know about the recent developments in secondary and micronutrient fertilizers and their quality

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Course Code	AGR567	
Course Title	**Land degradation and restoration**	
Type of course	Theory	
L T P	1 : 0 : 0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To study about the different factors and processes involved in land degradation, restoration, conservation and their management.	
Course Outcomes	CO1	Describe the factors and processes of soil land degradation and its impact on soil productivity
	CO2	Understand the land restoration and conservation techniques in erosion control.
	CO3	Describe the extent, diagnosis and mapping of land degradation by conventional and modern RS-GIS tools

Course Code	AGR569	
Course Title	**Masters Research**	
Type of course	Practical	
L T P	0:0:4	
Credits	4(0+4)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the data collection, analyze data and interpretation.	
Course outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	MAT529	
Course Title	**Experimental Designs**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To enable the students to understand the concepts involved in planning, designing their experiments and analysis of experimental data.	
Course outcomes	CO1	Valuate the suitability of the models treated in the course, for different experimental situations.
	CO2	Present the planning, implementation and analysis of a conducted experiment, in oral and written form.
	CO3	Analyse experimental data with suitable software.

Course Code	CSE551	
Course Title	**Computer fundamentals and programming**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To impart comprehensive knowledge about the computer fundamentals and programming	
Course outcomes	CO1	Bridge the fundamental concepts of computers with the present level of knowledge of the students.
	CO2	Familiarize operating systems, programming languages, peripheral devices, networking, multimedia and internet.
	CO3	Understand how logic circuits and Boolean algebra forms as the basics of digital computer.

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SEMESTER II

Course Code	AGR502	
Course Title	**Agronomy of oilseed, fibre and sugar crops**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the crop husbandry of oilseed, fibre and commercial crops.	
Course outcomes	CO1	Planning, seedbed preparation and layout of field experiments.
	CO2	To understand the different growth stages of crop, Intercultural operation in different crops.
	CO3	Estimation of crop yield on the basis of yield attributes.

Course Code	AGR506	
Course Title	**Dryland farming**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the basic concepts and practices of dryland farming and soil moisture conservation	
Course outcomes	CO1	Understanding of mid season contingent crop plan for aberrant weather conditions.
	CO2	Study of anti-transpirants and their effect on crops.
	CO3	Study of moisture stress effects and recovery behavior of important crops.

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Course Code	AGR550	
Course Title	**Soil erosion and conservation**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	1. To teach the basic concepts of soil erosion and its management. 2. To learn about the soil conservation practices and watershed management.	
Course outcomes	CO1	Students will be aware about the concept, causes factors affecting erosion and its management strategies.
	CO2	Students will understand Watershed management - concept, objectives and its approach and also Socioeconomic aspects of watershed management.
	CO3	Students will be familiarized about the role of remote sensing in assessment and planning of watersheds.

Course Code	AGR552	
Course Title	**Soil, water and air pollution**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the basic concepts of pollution problems associated with agriculture.	
Course outcomes	CO1	Students will understand about the concept, causes factors affecting air pollution.
	CO2	Students will understand the procedures to determine the chemical and biochemical oxygen demand, nutrients and heavy metals that are being polluting our environment.
	CO3	Students will learn about the management of pollution.

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Course Code	AGR554	
Course Title	**Soil fertility and fertilizer use**	
Type of course	Theory	
L T P	3 : 0 : 2	
Credits	4(3+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	• To familiarize the students about the soil fertility and productivity. • To study about the different mechanisms occurred in various nutrient transformations, their availability and different fertilizer technologies	
Course Outcomes	CO1	Describe the soil fertility and soil productivity, nutrient sources
	CO2	Understand soil and fertilizer nitrogen – sources, forms and various processes involved.
	CO3	Describe fertilizer use efficiency and blanket fertilizer recommendations

Course Code	AGR556	
Course Title	**Geomorphology and geochemistry**	
Type of course	Theory	
L T P	2 : 0 : 0	
Credits	2(2+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To study about the different methodologies in geomorphology and geochemistry and their applications.	
Course Outcomes	CO1	Students will be acquainted about the general introduction to geology and geochemistry
	CO2	Students will be know about the methodology of geomorphology, its agencies, erosion and weathering
	CO3	Students will understand the geochemical classification of elements,

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Course Code	AGR558
Course Title	**Remote sensing and GIS techniques for soil and crop studies**
Type of course	Theory and Practical
L T P	2:0:1
Credits	3(2+1)
Course prerequisite	B.Sc. (Agriculture)
Course Objectives	To teach the basic concepts of geological information system (GIS), remote sensing and their applications in agriculture

Course Code	AGR560	
Course Title	**Analytical techniques and instrumental methods in soil and plant analysis**	
Type of course	Theory and Practical	
L T P	0:0:2	
Credits	2(0+2)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives (CO)	To teach the various analytical techniques and instrumental methods in soil and plant analysis .	
Course Outcomes	CO1	Students will be acquainted about preparation of solutions for standard curves and analytical reagents
	CO2	Students will be know about the principles of visible, ultraviolet and infrared spectrophotometery
	CO3	Students will understand the electrochemical titration of clays

MASTER'S RESEARCH

Course Code	AGR500	
Course Title	**Masters Research**	
Type of course	Practical	
L T P	0:0:4	
Credits	4(0+4)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the data collection, analyze data and interpretation.	
Course outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	BOT522	
Course Title	Intellectual property and its management in agriculture	
Type of course	Theory	
L T P	2:0:0	
Credits	2(2+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To equip students and stakeholders with knowledge of intellectual property rights (IPR) related protection systems, their significance and use of IPR as a tool for wealth and value creation in a knowledge-based economy.	
Course outcomes	CO1	Students will be aware about of intellectual property right.
	CO2	Students will get aware about the protection of various types of intellectual properties.
	CO3	Students will be aware about international treaty on plant genetic resources for food and agriculture.

SEMESTER III

MASTER'S SEMINAR

Course Code	AGR603	
Course Title	**Masters Seminar**	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about their way of presentation, collection of data for thesis.	
Course outcomes	CO1	Students will demonstrate the ability to collaborate with others as they work on intellectual projects (reading, writing, speaking, researching...).
	CO2	Students will demonstrate the ability to follow discussions, oral arguments, and presentations, noting main points or evidence and tracking threads through different comments.
	CO3	Further, students will be able to challenge and offer substantive replies to others' arguments, comments, and questions, while remaining sensitive to the original speaker and the classroom audience.

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Course Code	AGR605	
Course Title	**Masters Comprehensive**	
Type of course	Practical	
L T P	0:0:2	
Credits	2(0+2)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To understand the basic knowledge of the discipline.	
Course outcomes	CO1	It will improve strong analytical, problem-solving and critical thinking abilities
	CO2	Depth knowledge of the discipline.
	CO3	Ability to communicate knowledge of the discipline

Course Code	AGR601	
Course Title	**Masters Research**	
Type of course	Practical	
L T P	0:0:4	
Credits	4(0+4)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the data collection, analyze data and interpretation.	
Course outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	EVS601	
Course Title	**Disaster Management**	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To study about the natural disaster and their management.	
Course outcomes	CO1	Capacity to integrate knowledge and to analyse, evaluate and manage the different public health aspects of disaster events at a local and global levels.
	CO2	Capacity to obtain, analyse, and communicate information on risks, relief needs.
	CO3	Lessons learned from earlier disasters in order to formulate strategies for mitigation in future scenarios with the ability to clearly present and discuss their conclusions and the knowledge and arguments behind them.

Course Code	LIB601	
Course Title	**Library and information services**	
Type of course	Practical	
L T P	0:0:2	
Credits	1(0+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	1.Educate and assist students in the identification and effective use of information resources 2. Provide current library materials and databases that support the academic curriculum	
Course outcomes	CO1	Identify and use search language, controlled vocabulary or search features appropriate to the research tool in order to retrieve relevant results.
	CO2	Select appropriate means for recording or saving relevant sources in order to retrieve them when needed.
	CO3	Observe and use pointers to additional information (authors, footnotes, bibliographies, controlled vocabulary, etc.) in order to locate additional sources.

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SEMESTER-IV

Course Code	AGR600	
Course Title	**Masters Research**	
Type of course	Practical	
L T P	0:0:16	
Credits	4(0+8)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the data collection, analyze data and interpretation.	
Course outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

Course Code	AGR602	
Course Title	Technical Writing and communications skills	
Type of course	Practical	
L T P	0:0:2	
Credits	1(0+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To equip the students/scholars with skills to write dissertations, research papers, etc. To equip the students/scholars with skills to communicate and articulate in English (verbal as well as writing).	
Course outcomes	CO1	Students will be able to know forms of technical writing thesis, technical papers, reviews, manuals .
	CO2	Students will understand the writing of abstracts, summaries, précis, and citations.
	CO3	Students will be able to know phonetic symbols and transcription, accentual pattern, weak forms in connected speech

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Course Code	AGR604	
Course Title	Human rights and constitutional duties	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To study the human rights and its actual status	
Course outcomes	CO1	Students will be aware about human rights its foundational aspects, nature and classification.
	CO2	Students will be aware about the human rights in India. Constitutional-legal framework, fundamental rights, directive principles of state policy governmental institutions for the protection of human rights.
	CO3	Students will understand the role of status of economic social & cultural rights in India.

Course Code	AGR606	
Course Title	Agriculture research, research, ethics and rural development programme	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To sensitize the scholars about the basic issues related with agricultural research, ethics in research as well as rural development.	
Course outcomes	CO1	Students will be aware research ethics: research integrity, research safety in laboratories, welfare of animals used in research.
	CO2	Students will be aware about connotations of rural development, rural development policies and strategies. rural development programmes, community development programme
	CO3	Students will understand Panchayati Raj, institutions, co-operatives, voluntary agencies/non-governmental organizations

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Scheme of Courses B. Sc. (Hons.) Agriculture Semester II							
S. No.	Subject/ Paper Code	Subject Name	Contact Hours (Lecture)	Contact Hours (Tutorial)	Contact Hours (Practical)	Total Contact Hours	Total Credit Hours
1.	AGR102	Fundamentals of Plant Biochemistry and Biotechnology	2	0	2	4	3(2+1)
2.	AGR104	Agricultural Microbiology	1	0	2	3	2(1+1)
3.	AGR106	Introductory Soil and Water Conservation Engineering	1	0	2	3	2(1+1)
4.	AGR108	Fundamentals of Crop Physiology	1	0	2	3	2(1+1)
5.	AGR110	Fundamentals of Agricultural Economics	2	0	0	2	2(2+0)
6.	AGR112	Fundamentals of Plant Pathology	3	0	2	5	4(3+1)
7.	AGR114	Fundamentals of Entomology	3	0	2	5	4(3+1)
8.	AGR116	Fundamentals of Agricultural Extension Education	2	0	2	4	3(2+1)
9.	AGR118	Communication Skills and Personality Development	1	0	2	3	2(1+1)
TOTAL			16		16	**32**	**24**

Total Contact Hours: 32
Total Credit Hours: 24

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Scheme of Courses B. Sc. (Hons.) Agriculture Semester VI							
S. No.	Subject/ Paper Code	Subject Name	Contact Hours (Lecture)	Contact Hours (Tutorial)	Contact Hours (Practical)	Total Contact Hours	Total Credit Hours
1.	AGR302	Rainfed Agriculture & Watershed Management	1	0	2	3	2 (1+1)
2.	AGR304	Protected Cultivation and Secondary Agriculture	1	0	2	3	2 (1+1)
3.	AGR306	Diseases of Field and Horticultural Crops and their Management-II	2	0	2	4	3 (2+1)
4.	AGR308	Post-harvest Management and Value Addition of Fruits and Vegetables	1	0	2	3	2 (1+1)
5.	AGR310	Management of Beneficial Insects	1	0	2	3	2 (1+1)
6.	AGR312	Crop Improvement-II *(Rabi crops)*	1	0	2	3	2 (1+1)
7.	AGR314	Practical Crop Production –II (*Rabi* crops)	0	1	4	4	2 (0+2)
8.	AGR316	Principles of Organic Farming	1	0	2	3	2 (1+1)
9.	AGR318	Farm Management, Production & Resource Economics	1	0	2	3	2 (1+1)
10	AGR320	Principles of Food Science and Nutrition	2	0	0	2	2(2+0)
11.	AGR322/ AGR324/ AGR326/ AGR328	Elective Course Food Safety and Standards	1/2 ϕ	0	4/2 ϕ	5/4 ϕ	3 credit ϕ
TOTAL			11+ 1/2 ϕ		20+ 4/2 ϕ	**31+5/4ϕ (35/36)**	**24**

ϕ Students have to opt 3 credits course which can be 1+2 or 2+1 course. (preferably 2+1 course.)

Total Contact Hours: 31+5/4ϕ (35/36)

Total Credit Hours: 24

¬ **Note:** SBBSU University will offer elective courses depending upon the availability of faculty (specialization of available faculty).

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Scheme of Courses B. Sc. (Hons.) Agriculture Semester IV							
S. No.	**Subject/ Paper Code**	**Subject Name**	**Contact Hours (Lecture)**	**Contact Hours (Tutorial)**	**Contact Hours (Practical)**	**Total Contact Hours**	**Total Credit Hours**
1.	AGR202	Crop Production Technology –II *(Rabi Crops)*	1	0	2	3	2(1+1)
2.	AGR204	Production Technology for Ornamental Crops, MAPs and Landscaping	1	0	2	3	2(1+1)
3.	AGR206	Renewable Energy and Green Technology	1	0	2	3	2(1+1)
4.	AGR208	Problematic Soils and their Management	0	0	2	2	2(2+0)
5.	AGR210	Production Technology for Fruit and Plantation Crops	1	0	2	3	2(1+1)
6.	AGR212	Principles of Seed Technology	1	0	4	5	3(1+2)
7.	AGR214	Farming System and Sustainable Agriculture	1	0	0	1	1(1+0)
8.	AGR216	Agricultural Marketing, Trade and Prices	2	0	2	4	3(2+1)
9.	AGR218	Introductory Agro-meteorology & Climate Change	1	0	2	3	2(1+1)
10.	AGR220/ AGR222/ AGR224/ AGR226	Elective Course	1/2 ϕ	0	4/2 ϕ	5/4 ϕ	3 credit ϕ
TOTAL			11+ 1/2 ϕ		16+ 4/2 ϕ	**27+5/4ϕ (31/32)**	**22**

ϕ Students have to opt 3 credits course which can be 1+2 or 2+1 course.

Total Contact Hours: 27+5/4ϕ (31/32)

Total Credit Hours: 22

¬ **Note:** SBBSU University will offer elective courses depending upon the availability of faculty (specialization of available faculty).

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Institute Name:	**UISH**
Department Name:	**Agricultural Sciences**
Programme Name:	**M.Sc. Ag. Agronomy**
Number of Semetsers	**4**

Vision:

To develop skilled and efficient human resource in the field of Agronomy for imparting education to students, undertaking appropriate research on crop and natural resource management on sustainable basis in the hills and mountains, extend knowledge and skill to the hill farmers.

Mission:

1. To achieve excellence in the curriculum planning pertaining to agronomy by periodically updating it in order to provide the students with sound technical knowledge.
2. To strengthen the research activities in Agronomy by undertaking innovative and application oriented projects for the development of Agricultural and allied sectors.
3. To stimulate and nurture student's interest in agronomy and achieve their professional goals
4. To generate, disseminate, integrate and apply knowledge which is vital to society and to provide leadership and service to the nation.

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Details of Programme Educational Objectives, Program Outcomes, Program Specific Outcomes

S. No.		Programme Educational Objective (PEO) (The Graduate/Undergraduate will....)
1	PEO1.	Train and develop scholars and promote research by providing students with contemporary concepts in various fields of crop agronomy.
	PEO2.	Generate knowledge through training in cognitive, affective, and psychomotor, which are necessary for productive scholarly research in a selected area of crop agronomy.
	PEO3	Acquire in-depth knowledge in area(s) of specialization.
	PEO4	Undertake independent research and present results in a coherent and comprehensive manner and hence enrich area(s) of scholarship.
2		**Programme Outcomes (PO) (At the end of Programme/Degree mentioned above , the graduates will be able to ……)**
	PO1.	Specific knowledge of various branches specialized to their studies.
	PO2.	Detailed knowledge on the subject to improve the farmer's condition by their contributions.
	PO3	Detailed knowledge of cultivation practices, soil, fertilizers, livestock's insect pest, economic associated with farming enterprises.
	PO4	Use appropriate scientific and statistical methods and evaluations for decision making in various sectors of agriculture.
3		**Programme Specific Outcomes (PSO)**
	PSO1.	Demonstrate use of written and oral communication skills.
	PSO2.	Understanding the basic concepts and theories and terminology of agronomy.
	PSO3	Undertake teaching, research and offer administrative and consultancy services to organizations.
	PSO4	Apply research and expertise in solving or suggesting solutions to problems in the agricultural industry

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SEMESTER-I

Course Code	AGR501	
Course Title	**Modern concepts in crop production**	
Type of course	Theory	
L T P	3:0:0	
Credits	3(3+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the basic concepts of soil management and crop production.	
Course outcomes	CO1	Describe the role of physiological processes controlling plant growth and development.
	CO2	Understand the effect of environment and management on crop growth, rate of development, water and nutrient use efficiency.
	CO3	Describe the impact of latest crop management practices on crop productivity and resource use efficiency.

Course Code	AGR503	
Course Title	**Principles and practices of soil fertility and nutrient management**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To impart knowledge of soil fertility and plant nutrients and apprise about the integrated approach of plant nutrition and sustainability of soil resources.	
Course outcomes	CO1	Students will learn about the preparation and use of organic manure, management of organic waste and residue management.
	CO2	Students will know how the commercial fertilizers are being prepared, their use and nutrient interaction.
	CO3	Students will be able to understand the different methods of application of the fertilizers.

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Course Code	AGR505	
Course Title	**Principles and practices of weed management**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the weeds, herbicides and methods of weed control.	
Course outcomes	CO1	Understand the behavior of herbicides in the environment.
	CO2	Evolution of herbicide resistance in weeds.
	CO3	Management of different types of weeds.

Course Code	AGR511	
Course Title	**Agronomy of fodder and forage crops**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives	To teach the crop husbandry of major fodder and forage crops.	
Course outcomes	CO1	The students will understand about adaptation, distribution, improved varieties, agro-techniques of different forages.
	CO2	The students will be aware about the different biochemical changes while making the silage.
	CO3	Work out the economics of the different forage crops

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Course Code	AGR515	
Course Title	**Masters Research**	
Type of course	Practical	
L T P	0:0:4	
Credits	4(0+4)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the data collection, analyze data and interpretation.	
Course outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

Course Code	MAT529	
Course Title	**Experimental Designs**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To enable the students to understand the concepts involved in planning, designing their experiments and analysis of experimental data.	
Course outcomes	CO1	Valuate the suitability of the models treated in the course, for different experimental situations.
	CO2	Present the planning, implementation and analysis of a conducted experiment, in oral and written form.
	CO3	Analyse experimental data with suitable software.

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Course Code	CSE551	
Course Title	**Computer fundamentals and programming**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To impart comprehensive knowledge about the computer fundamentals and programming	
Course outcomes	CO1	Bridge the fundamental concepts of computers with the present level of knowledge of the students.
	CO2	Familiarize operating systems, programming languages, peripheral devices, networking, multimedia and internet.
	CO3	Understand how logic circuits and Boolean algebra forms as the basics of digital computer.

SEMESTER-II

Course Code	AGR502	
Course Title	**Agronomy of oilseed, fibre and sugar crops**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the crop husbandry of oilseed, fibre and commercial crops.	
Course outcomes	CO1	Planning, seedbed preparation and layout of field experiments.
	CO2	To understand the different growth stages of crop, Intercultural operation in different crops.
	CO3	Estimation of crop yield on the basis of yield attributes.

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Course Code	AGR504	
Course Title	**Cropping systems**	
Type of course	Theory	
L T P	2:0:0	
Credits	2(2+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To acquaint the students about prevailing cropping systems in the country and practices to improve productivity.	
Course outcomes	CO1	Students will be aware about the cropping systems, their types prevailing in India and how natural resources can be utilized for the beneficial cropping system.
	CO2	Students will be aware about the different competition relations, above and below ground interactions and allelopathic effects.
	CO3	Students will understand the role of organic matter, crop residue management and how fertilizer use efficiency can be increased of different fertilizers.

Course Code	AGR506	
Course Title	**Dryland farming**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the basic concepts and practices of dryland farming and soil moisture conservation	
Course outcomes	CO1	Understanding of mid season contingent crop plan for aberrant weather conditions.
	CO2	Study of anti-transpirants and their effect on crops.
	CO3	Study of moisture stress effects and recovery behavior of important crops.

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Course Code	AGR510	
Course Title	**Agrometeorology and crop weather forecasting**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To impart knowledge about agro-meteorology and crop weather forecasting to meet the challenges of aberrant weather conditions	
Course outcomes	CO1	Students will get aware about the agro-meteorology and development in relation to crop environment, composition of atmosphere, distribution of atmospheric pressure and wind.
	CO2	Students will be aware about effects of temperature on plant physiological processes, measures of atmospheric temperature, relative humidity.
	CO3	Students will understand weather forecasting, short, medium and long range, aerospace science and weather forecasting, benefits of weather services to agriculture.

Course Code	AGR512	
Course Title	**Agronomy of medicinal, aromatic and under-utilized crops**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the crop husbandry of medicinal, aromatic and under-utilized crops	
Course outcomes	CO1	Students will understand about the of medicinal and aromatic plants in human health.
	CO2	Students will be aware about cultural practices, yield and important constituents of medicinal plants.
	CO3	Students will understand Climate and soil requirements of some underutilized crops

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Course Code	AGR514	
Course Title	**Agrostology and agroforestry**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To study about the grassland ecology and agroforestry system	
Course outcomes	CO1	Students will understand about Agrostology, grassland ecology – community, climax, dominant species, succession, biotype, ecological status of grassland.
	CO2	Students will be aware about agroforestry agroforestry systems, agrisilviculture, silvipasture, agrisilvipasture systems.
	CO3	Students will understand production technology in agro-forestry and agrostology system.

Course Code	AGR516	
Course Title	**Principles and practices of organic farming**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To study about the concept of organic farming and different organic practices in crop production	
Course outcomes	CO1	Students will understand about the organic farming its various types, biodynamic farming, vedic farming.
	CO2	Students will be aware about soil fertility, nutrient recycling, organic residues, organic manures and composting.
	CO3	Students will understand control of weeds, diseases and insect pest management, biological agents and pheromones, biopesticides.

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Course Code	AGR518	
Course Title	**Mechanism of herbicide action**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the herbicides, methods of weed control and herbicide action	
Course outcomes	CO1	Students will be familiarizing with the herbicides, herbicide usage, classification of herbicides based on their mode of action.
	CO2	Students will get aware about the translocation of herbicides, their effect on growth and development.
	CO3	Students will be aware about the persistence of herbicides, their residual effect and methods of overcoming the residual effect of herbicides.

Course Code	AGR500	
Course Title	**Masters Research**	
Type of course	Practical	
L T P	0:0:4	
Credits	4(0+4)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the data collection, analyze data and interpretation.	
Course outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	AGR550	
Course Title	**Soil erosion and conservation**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	1. To teach the basic concepts of soil erosion and its management. 2. To learn about the soil conservation practices and watershed management.	
Course outcomes	CO1	Students will be aware about the concept, causes factors affecting erosion and its management strategies.
	CO2	Students will understand Watershed management - concept, objectives and its approach and also Socioeconomic aspects of watershed management.
	CO3	Students will be familiarized about the role of remote sensing in assessment and planning of watersheds.

Course Code	AGR552	
Course Title	**Soil, water and air pollution**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the basic concepts of pollution problems associated with agriculture.	
Course outcomes	CO1	Students will understand about the concept, causes factors affecting air pollution.
	CO2	Students will understand the procedures to determine the chemical and biochemical oxygen demand, nutrients and heavy metals that are being polluting our environment.
	CO3	Students will learn about the management of pollution.

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Course Code	BOT522	
Course Title	Intellectual property and its management in agriculture	
Type of course	Theory	
L T P	2:0:0	
Credits	2(2+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To equip students and stakeholders with knowledge of intellectual property rights (IPR) related protection systems, their significance and use of IPR as a tool for wealth and value creation in a knowledge-based economy.	
Course outcomes	CO1	Students will be aware about of intellectual property right.
	CO2	Students will get aware about the protection of various types of intellectual properties.
	CO3	Students will be aware about international treaty on plant genetic resources for food and agriculture.

SEMESTER-III

Course Code	AGR607	
Course Title	**Principles and practices of water management**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the principles of water management and practices to enhance the water productivity.	
Course outcomes	CO1	To give students comprehensive knowledge of crop water requirement and its estimations.
	CO2	To introduce students with basic criterions of irrigation project evaluation.
	CO3	Technically understand, design of irrigation structures including for drainage management.

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Course Code	**AGR609**	
Course Title	**Agronomy of major cereals and pulses**	
Type of course	Theory and Practical	
L T P	2:0:2	
Credits	3(2+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To teach the crop husbandry of major cereals and pulses.	
Course outcomes	CO1	To study the production technology of cereals and pulses.
	CO2	To identify characteristic of crops, cultivars, and seeds.
	CO3	Understanding the method to calculate the cost of cultivation of different crops.

Course Code	**AGR603**	
Course Title	**Masters Seminar**	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about their way of presentation, collection of data for thesis.	
Course outcomes	CO1	Students will demonstrate the ability to collaborate with others as they work on intellectual projects (reading, writing, speaking, researching...).
	CO2	Students will demonstrate the ability to follow discussions, oral arguments, and presentations, noting main points or evidence and tracking threads through different comments.
	CO3	Further, students will be able to challenge and offer substantive replies to others' arguments, comments, and questions, while remaining sensitive to the original speaker and the classroom audience.

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Course Code	AGR605	
Course Title	**Masters Comprehensive**	
Type of course	Practical	
L T P	0:0:2	
Credits	2(0+2)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To understand the basic knowledge of the discipline.	
Course outcomes	CO1	It will improve strong analytical, problem-solving and critical thinking abilities
	CO2	Depth knowledge of the discipline.
	CO3	Ability to communicate knowledge of the discipline

Course Code	AGR601	
Course Title	**Masters Research**	
Type of course	Practical	
L T P	0:0:4	
Credits	4(0+4)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the data collection, analyze data and interpretation.	
Course outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

Course Code	EVS601	
Course Title	**Disaster Management**	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To study about the natural disaster and their management.	
Course outcomes	CO1	Capacity to integrate knowledge and to analyse, evaluate and manage the different public health aspects of disaster events at a local and global levels.
	CO2	Capacity to obtain, analyse, and communicate information on risks, relief needs.
	CO3	Lessons learned from earlier disasters in order to formulate strategies for mitigation in future scenarios with the ability to clearly present and discuss their conclusions and the knowledge and arguments behind them.

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Course Code	LIB601	
Course Title	**Library and information services**	
Type of course	Practical	
L T P	0:0:2	
Credits	1(0+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	1.Educate and assist students in the identification and effective use of information resources 2. Provide current library materials and databases that support the academic curriculum	
Course outcomes	CO1	Identify and use search language, controlled vocabulary or search features appropriate to the research tool in order to retrieve relevant results.
	CO2	Select appropriate means for recording or saving relevant sources in order to retrieve them when needed.
	CO3	Observe and use pointers to additional information (authors, footnotes, bibliographies, controlled vocabulary, etc.) in order to locate additional sources.

SEMESTER-IV

Course Code	AGR600	
Course Title	**Masters Research**	
Type of course	Practical	
L T P	0:0:4	
Credits	4(0+4)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To familiarize the students about the data collection, analyze data and interpretation.	
Course outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	AGR602	
Course Title	Technical Writing and communications skills	
Type of course	Practical	
L T P	0:0:2	
Credits	1(0+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To equip the students/scholars with skills to write dissertations, research papers, etc. To equip the students/scholars with skills to communicate and articulate in English (verbal as well as writing).	
Course outcomes	CO1	Students will be able to know forms of technical writing thesis, technical papers, reviews, manuals .
	CO2	Students will understand the writing of abstracts, summaries, précis, and citations.
	CO3	Students will be able to know phonetic symbols and transcription, accentual pattern, weak forms in connected speech

Course Code	AGR604	
Course Title	Human rights and constitutional duties	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To study the human rights and its actual status	
Course outcomes	CO1	Students will be aware about human rights its foundational aspects, nature and classification.
	CO2	Students will be aware about the human rights in India. Constitutional-legal framework, fundamental rights, directive principles of state policy governmental institutions for the protection of human rights.
	CO3	Students will understand the role of status of economic social & cultural rights in India.

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Course Code	AGR606	
Course Title	Agriculture research, research, ethics and rural development programme	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course objective	To sensitize the scholars about the basic issues related with agricultural research, ethics in research as well as rural development.	
Course outcomes	CO1	Students will be aware research ethics: research integrity, research safety in laboratories, welfare of animals used in research.
	CO2	Students will be aware about connotations of rural development, rural development policies and strategies. rural development programmes, community development programme
	CO3	Students will understand Panchayati Raj, institutions, co-operatives, voluntary agencies/non-governmental organizations

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SANT BABA BHAG SINGH UNIVERSITY, KHIALA -1430030, JALANDHAR

Institute Name:	**UIS**
Department Name:	**Agriculture**
Programme Name:	**M.Sc. Ag. Horticulture (Vegetable Science)**
Number of Semetsers	**4**

Vision:

1. To develop skilled students with basic and applied knowledge and skills of horticultural crops production & management protection and soil fertility management principles & concepts, Vegetable crops
2. Enable the students to understand and realize problems in fruit crop production and seek solutions through exposure to research, extension and management.

Mission:

1. To achieve excellence in the curriculum planning pertaining to Horticulture (Vegetable Science) by periodically updating it in order to provide the students with sound technical knowledge.
2. To strengthen the research activities in fruit science by undertaking innovative and application oriented projects for the development of Agricultural and allied sectors.
3. Generating knowledge and producing skilled manpower in the field of horticulture
4. Modernizing horticultural crop production sector by supplying it improved technologies i.e. improved seed or planting material, propagation techniques, optimum fertilization, irrigation etc.

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Details of Programme Educational Objectives, Program Outcomes,Program Specific Outcomes

S.No.		Programme Educational Objective (PEO)
1	PEO1.	Train and develop scholars and promote research by providing students with contemporary concepts in various fields of crop Horticulture.
	PEO2.	Generate knowledge through training in cognitive, affective, and psychomotor, which are necessary for productive scholarly research in a selected area of Vegetable science
	PEO3	Acquire in-depth knowledge in area(s) of specialization.
	PEO4	The program will contribute to the development of agricultural sector and thereby ensure food security and self-sufficiency.
2		**Programme Outcomes (PO)**
	PO1.	Programme deals with the production aspects of vegetable crops at commercial level, seed production, and hybrid seed development, breeding approach in vegetables, organic vegetable production and protected cultivation of vegetable crops. Programme provides complete solution to the problems associated with development of vegetable production as industry.
	PO2.	Detailed knowledge on the subject to improve the farmer's condition by their contributions.
	PO3	Detailed knowledge of cultivation practices of tropical, subtropical, temperate and arid region fruits, soil, fertilizers insect pest, economic associated with farming enterprises.
	PO4	Use appropriate scientific and statistical methods and evaluations for decision making in various sectors of agriculture.
3		**Programme Specific Outcomes (PSO)**
	PSO1.	Demonstrate use of written and oral communication skills.
	PSO2.	Understanding the basic concepts and theories and terminology of Fruit Science
	PSO3	Undertake teaching, research and offer administrative and consultancy services to organizations.
	PSO4	Apply research and expertise in solving or suggesting solutions to problems in the agricultural industry

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Semester- I

Course Code	AGR571	
Course Title	**Production technology for cool season vegetable crops**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2 +1)	
Course prerequisite	B.Sc (Agriculture)	
Course objectives (CO)	To educate production technology of cool season vegetables.	
Course Outcomes	CO1	Through this course students should be able to describe the production technology of temperate vegetable crops.
	CO2	devise cropping scheme and plan for commercial vegetable production
	CO3	apply knowledge of intercultural practices for improving yield of vegetable crops. develop skills for growing temperate vegetable crops.

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Course Code	AGR573	
Course Title	**Growth and development of vegetable crops**	
Type Course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2 +1)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To teach the physiology of growth and development of vegetable crops.	
Course Outcomes	CO1	**Through this course students should be able to** define the pattern of plant growth and development in vegetable crops.
	CO2	illustrate the mechanism of plant dormancy and plant physiology in vegetable crops.
	CO3	apply plant growth regulators in vegetable crops for increasing quality production.

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Course Code	**AGR575**	
Course Title	**Systematics of vegetable crops**	
Type Course	Theory & Practical	
L T P	1 0 1	
Credits	2(1 +1)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To teach morphological, cytological and molecular taxonomy of vegetable crops.	
Course Outcome	CO1	Students will be able to understand cytological levels of various vegetable crops
	CO2	Students will understand role of molecular markers in improvement of vegetable crops
	CO3	Students will be understand the interaction of vegetable crops with their environment.

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Course Code	MAT529	
Course Title	**Experimental designs**	
Type of Course	Theory	
L T P	2 0 1	
Credits	3(2 +1)	
Course Prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	Mathematics is really a great tool to understand the things correctly. The aim of the course is to enable students : (1) To understand the theory knowledge as well as practical knowledge of different formulas.(2) To inculcate the skills to use different methods to solve the applied problems.	
Course Outcomes	CO1	Students will understand the theory knowledge as well as practical knowledge of different formulas
	CO2	Analysis of data pertaining to attributes and to interpret the results.
	CO3	Making familiar with some elementary statistical methods of analysis of research data

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Course Code	CSE551	
Course Title	COMPUTER FUNDAMENTALS AND PROGRAMMING	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3(2 +1)	
Course prerequisite	B.Sc (Agriculture)/CSE	
Course Objectives (CO)	To impart comprehensive knowledge about the computer fundamentals and programming	
Course Outcomes	CO1	Students will be able to operate the Sequencing, alteration and iteration, arrays, string processing
	CO2	Students will be able to Computer programming Fundamentals
	CO3	Students will be to do conversion of different number types; creation of flowchart

Syllabus

Course Code	AGR515	
Course Title	Master's Research	
Type of course	Practical	
L T P	0 0 4	
Credits	4(0 + 4)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	AGR570	
Course Title	**Production technology for warm season vegetable crops**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	2 +1	
Course prerequisite	B.Sc (Agriculture)	
Course objectives (CO)	To teach production technology of warm season vegetables.	
Course Outcomes	CO1	**Through this course students should be able to** discuss the importance and production technology of warm season vegetables. enumerate physiological disorders and their management of warm season vegetables.
	CO2	identify and manage biotic and abiotic factors causing problems in crop production.
	CO3	describe harvesting indices and methods in warm season vegetables.

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Course Code	AGR572	
Course Title	**Breeding of Vegetable Crops**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	2 +1	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	To educate principles and practices adopted for breeding of vegetable crops	
Course Outcomes	CO1	**Through this course students should be able to** describe principles and practices adopted for breeding of vegetable crops.
	CO2	discuss breeding techniques and achievements in vegetable crops.
	CO3	apply advance techniques of breeding in vegetable crops.

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Course Code	**AGR574**	
Course Title	**Production technology of underexploited vegetable crops**	
Type Course	Theory & Practical	
L T P	2 0 1	
Credits	3(2 +1)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To educate production technology of underutilized vegetable crops.	
Course Outcomes	CO1	**Through this course students should be able to** discuss the importance and production technology of underexploited vegetables. enumerate physiological disorders and their management of warm season vegetables.
	CO2	identify and manage biotic and abiotic factors causing problems in crop production.
	CO3	describe harvesting indices and methods in warm season vegetables.

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Course Code	**AGR550**	
Course Title	**Soil erosion and conservation**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3(2 +1)	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	To study the impact of erosion on soil, water and air quality and how to conserve soil erosion	
Course Outcomes	CO1	To provide knowledge about waste land and problematic soils in India and management of the soils.
	CO2	Knowledge of different reclamation and management practices for the development of the soils.
	CO3	To Understand different factors responsible for saline , sodic and acidic soils and their properties.

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Course Code	AGR552	
Course Title	**Soil, water and air pollution**	
Type of course	Theory & Practical	
L T P	2 0 1	
Credits	3(2+1)	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	To study the pollution impact on soil, air & water and its remediation	
Course Outcomes	CO1	To aware the students about causes, effects and remedies to prevention and mitigation of soil pollution
	CO2	Students will be able to know remote sensing applications in monitoring and management of soil and water pollution.
	CO3	Students will be able to know Remediation/amelioration of contaminated soil and water,

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Course Code	AGR500	
Course Title	Master's Research	
Type of course	Practical	
L T P	0 0 4	
Credits	4 (0+ 4)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcome	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	**BOT522**	
Course Title	Intellectual property and its management in agriculture	
Type of course	Theory	
L T P	2:0:0	
Credits	2(2+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives	To equip students and stakeholders with knowledge of intellectual property rights (IPR) related protection systems, their significance and use of IPR as a tool for wealth and value creation in a knowledge-based economy.	
Course Outcome	CO1	Students will be able to understand Historical perspectives and need for the introduction of Intellectual Property Right
	CO2	Students will be able to understand National Biodiversity protection initiatives. Convention on BiologicalDiversity.
	CO3	Students will be able to understand Research collaboration Agreement, License agreement

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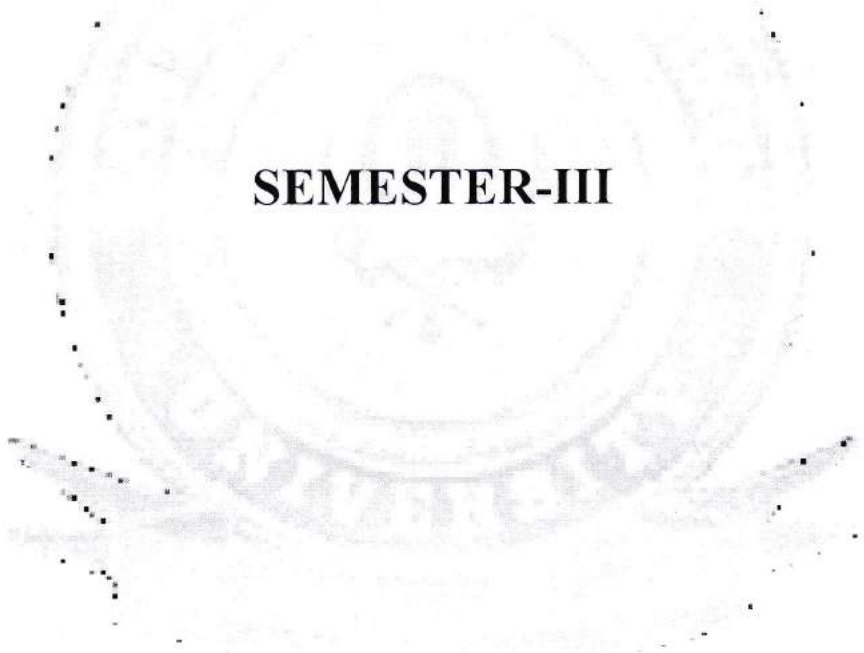
SEMESTER-III



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Course Code	AGR577	
Course Title	Seed production technologyof vegetable Crops	
Type Course	Theory & Practical	
L T P	1 0 1	
Credits	2(1 +1)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To educate principles and methods of quality seed and planting material production in vegetable crops	
Course Outcomes	CO1	Students will learn about production of delicate vegetable seeds
	CO2	They will learn the new technology to produce more yield in vegetable
	CO3	They will learn the diverse way of cultivation

Course Code	AGR579	
Course Title	Post Harvest Technology of vegetable crops	
Type Course	Theory & Practical	
L T P	2 0 1	
Credits	3 (2 +1)	
Course Pre-requisite	B.Sc (Agriculture)	
Course Objective (CO)	To educate principles and practices of processing of vegetable crops	
Course Outcomes	CO1	On completion of course the students will be able to Understand technologies of post-harvest technology and its role in providing better quality produce to the consumer
	CO2	Understand importance of prevention of losses Understand functional foods and nutraceuticals
	CO3	Students will be aware about the importance of Marketing linkage for fresh produce and processed products

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Course Code	**EVS 601**	
Course Title	**Disaster Management and Risk Mangement**	
Type of course	Theory	
L T P	2 0 0	
Credits	2(1 +0)	
Course prerequisite	B.Sc (Agriculture)	
Course Objective(CO)	To introduce learners to the key concepts and practices of natural disaster management; to equip them to conduct thorough assessment of hazards, and risks vulnerability and capacity building	
Course Outcome	CO1	Students will be able to understand the nature of natural disasters, their types and effects
	CO2	Students will be able to understand the nature of manmade disasters, their types and effects
	CO3	Students will be able to understand the role of NGOs

Course Code	**LIB601**	
Course Title	**Library and Information Services**	
Type of course	Theory	
L T P	0 0 1	
Credits	1 (0 +1)	
Course prerequisite	B.Sc (Agriculture)	
Course Objectives (CO)	1. Educate and assist students in the identification and effective useof informationresources 2. Provide current library materials and databases that supportthe academic curriculum	
Course Outcome	CO1	**Through this course students should be able to** Trace information from libraries efficiently.
	CO2	Apprise the information and knowledge resources
	CO3	Use modern tools like internet, OPAC, search engines etc for information searching.

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Course Code	AGR 603	
Course Title	**Master's Seminar**	
Type of course	Practical	
L T P	1 0 0	
Credits	1(1 +0)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcome	CO1	Students will demonstrate the ability to collaborate with others as they work on intellectual projects (reading, writing, speaking, researching...).
	CO2	Students will demonstrate the ability to follow discussions, oral arguments, and presentations, noting main points or evidence and tracking threads through different comments.
	CO3	Further, students will be able to challenge and offer substantive replies to others' arguments, comments, and questions, while remaining sensitive to the original speaker and the classroom audience.

Course Code	AGR605	
Course Title	**Master's Comprehensive Exam**	
Type of course	Practical	
L T P	0 0 2	
Credits	2(0 +2)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcomes,	CO1	It will improve strong analytical, problem-solving and critical thinking abilities
	CO2	Depth knowledge of the discipline.
	CO3	Ability to communicate knowledge of the discipline

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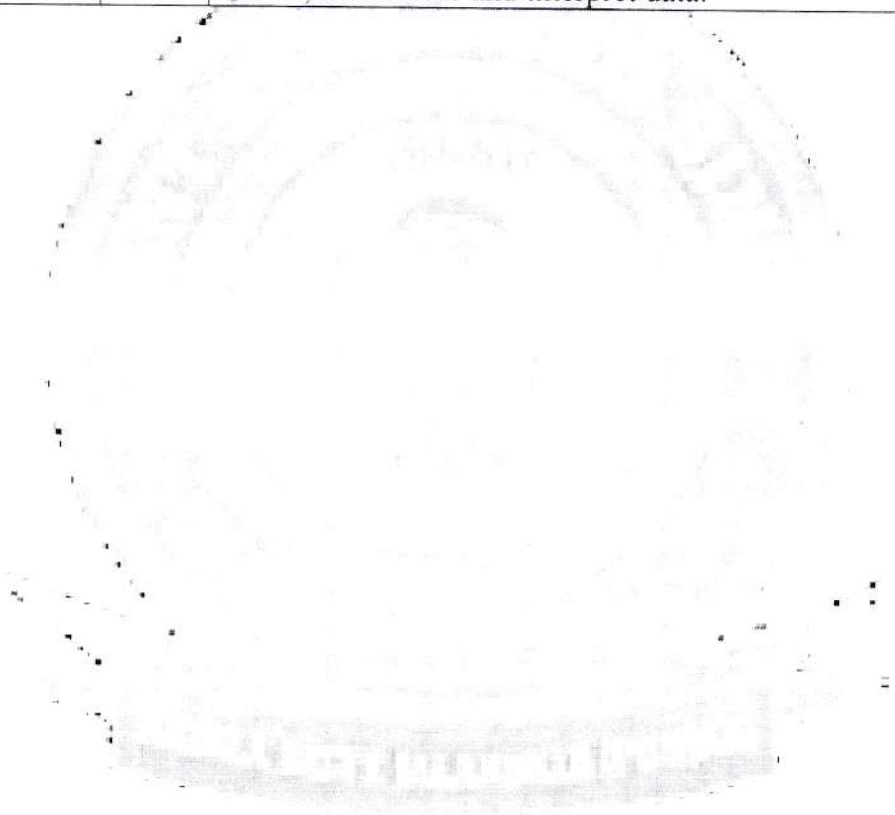
Course Code	AGR601	
Course Title	**Master's Research**	
Type of course	Practical	
L T P	0 0 4	
Credits	4(0 + 4)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.



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Semester - IV

Course Code	**AGR600**	
Course Title	**Master's Research**	
Type of course	Practical	
L T P	0 0 8	
Credits	8 (0 + 8)	
Course prerequisite	B.Sc (Agriculture)	
Course Outcomes	CO1	This program will provide students the theoretical and research backgrounds necessary to design, implement, and manage different cropping system.
	CO2	Students will conduct field trials.
	CO3	Collect, summarize and interpret data.

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Course Code	BOT624	
Course Title	**Technical Writing and communications skills**	
Type of course	Practical	
L T P	0:0:2	
Credits	1(0+1)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives	To equip the students/scholars with skills to write dissertations, research papers, etc. To equip the students/scholars with skills to communicate and articulate in English (verbal as well as writing).	
Course Outcomes	CO1	Students will analyze basic communication skills.
	CO2	Students will be able to understand carious forms of scientific writings
	CO3	Students will analyze intercultural communication skills.

Course Code	AGR604	
Course Title	**Human rights and constitutional duties**	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives	To study the human rights and its actual status	
Course outcomes	CO1	By the end of the course students should be able to: Demonstrate a good understanding of the provisions under the Constitution of India dealing with human rights
	CO2	Display a good understanding of the nature and scope of special legislations dealing with protection of human rights of marginalized and vulnerable sections.
	CO3	Demonstrate a good understanding of the practical application of human rights law to specific human rights problems in India.

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Course Code	**AGR606**	
Course Title	**Agriculture research, research, ethics and rural development programme**	
Type of course	Theory	
L T P	1:0:0	
Credits	1(1+0)	
Course prerequisite	B.Sc. (Agriculture)	
Course Objectives	To sensitize the scholars about the basic issues related with agricultural Research, ethics in research as well as rural development.	
Course Outcomes	CO1	**Through this course students should be able to** analyze the pros and cons of the Indian agricultural system
	CO2	describe the rural development status and programmes in India
	CO3	extend their knowledge of agricultural research ethics

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