

Semester Sixth**Hrs. 24**

Course Code	Course Title	Load Allocation			Marks Distribution		Total	Credits
		L	T	P	Internal	External		
BSAG-601	Crop Residue Management	2	0	0	40	60	100	2
BSAG-602	Diseases of Horticultural Crops and their Management	2	0	0	40	60	100	2
BSAG-603	Flower Cultivation and Landscape Gardening	2	0	0	40	60	100	2
BSAG-604	Breeding of Field and Horticultural Crops	2	0	0	40	60	100	2
BSAG-605	Environmental Science and Disaster Management	2	0	0	40	60	100	2
BSAG-606	Fundamentals of Agri-business Management	2	0	0	40	60	100	2
BSAG-607	Protected Cultivation and Post-Harvest Technology	2	0	0	40	60	100	2
BSAG-608	Renewable Energy	1	0	0	40	60	100	1
BSAG-609	Post-harvest Management of Fruits and Vegetables	2	0	0	40	60	100	2
BSAG-610	Practical Crop Production-II (Rabi Crops)	0	0	1	30	20	50	1
BSAG-611	Diseases of Horticultural Crops and their Management (Practical)	0	0	1	30	20	50	1
BSAG-612	Flower Cultivation and Landscape Gardening (Practical)	0	0	1	30	20	50	1
BSAG-613	Breeding of Field and Horticultural Crops (Practical)	0	0	1	30	20	50	1
BSAG-614	Protected Cultivation and Post-Harvest Technology (Practical)	0	0	1	30	20	50	1
BSAG-615	Renewable Energy (Practical)	0	0	1	30	20	50	1
BSAG-616	Post-harvest Management of Fruits and Vegetables (Practical)	0	0	1	30	20	50	1
	TOTAL	17	0	7	570	680	1250	24

BSAG-601 Crop Residue Management**Unit-I**

Significance of crop residue management. Challenges for diversified use of crop residue in high cropping intensity areas.

Unit-II

Crop residue in relation to agricultural ecosystems and conservation agriculture. On-site and off-site management of crop residues and soil health indicators.

Unit-III

Beneficial effects of crop residue on soil health crop yields, social and environmental concerns

Unit-IV

Recent technologies for conservation agriculture. Policy options for efficient residue management in Punjab

Books

- Crop residue management in Rice-wheat cropping system by M.L. Dotaniya. Published by Lambard Academic Publishing.
 - Crop residue management for conservation by Verlon K Vrana.
 - Crop residue management by J.L.Hatfield & A.Stewart.
 - Managing Agricultural Residues by Paul W. Unger.
 - Crop residue management: for Soil Health, crop productivity, & Environmental Quality by S.K. Sharma.
 - Residue Management Devices for No- till Drills by Rashad Hegazy.
 - Agricultural Residue management In developing Countries by lea Kai
-

BSAG-602 Diseases of Horticultural Crops and their Management

Unit-I

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of citrus, mango, banana, grapevine, pomegranate and papaya

Unit-II

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of guava, sapota, ber, apple, pear, peach and plum

Unit-III

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of chilli, brinjal, okra, potato, crucifers, cucurbits, tomato, pea, beans, onion and garlic

Unit-IV

Economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of rose, chrysanthemum, gladiolus, marigold and jasmine

Books recommended

- Diseases of Horticulture crops & their management by GP Jagtap.
- Fungal diseases & Their Management In Horticulture crops By P. Parvatha Reddy.
- Field Problems of Crops By Pau Ludhiana
- Introductory Plant Pathology by Tripathi DP.

BSAG-603 Flower Cultivation and Landscape Gardening

Unit-I

Introduction to floriculture and landscaping. Package of practices for rose, jasmine, chrysanthemum, gladiolus, marigold and tuberose.

Unit-II

Planning of gardens. Landscape-art principles, Formal and informal gardens.

Unit-III

Use of trees, shrubs, climbers, palms and houseplants

Unit-IV

Seasonal flowers and their use in the gardens, Making and maintenance of lawns.

Books recommended

1. Introductory Ornamental Horticulture by JS Arora.
2. Garden Flowers by Swarup, S.
3. Flowers Cultivation & Landscaping By PAU Ludhiana
4. Flouriculture at a Glance by Desh Raj

BSAG-604 Breeding of Field and Horticultural Crops

Unit-I

Breeding objectives and concepts of breeding self-pollinated, cross-pollinated and vegetative propagated crops; Hardy-Weinberg Law; Origin of crops and distribution of species, wild relatives and forms, Cereals, (rice, wheat, maize and millets); Pulses (red gram, green gram, black gram, soybean); Oilseeds (groundnut, sesame, sunflower, brassicas) etc, Fibres (Cotton) etc, Vegetables (tomato, potato, onion, okra); Flower crops (chrysanthemum, rose, gaillardia and marigold); Fruits (citrus, amla, guava, mango, papaya)

Unit II

Breeding methods for development of varieties/hybrids in various crops; Ideotype concept in crop improvement; Plant genetic resources their conservation and utilization in crop improvement; IPR and its related issues.

Unit III

Variability in pathogen and pests; Mechanisms of resistance in plants to pathogens and pests; Genetic basis of adaptability to unfavourable environments; Breeding for resistance to biotic and abiotic stresses.

Unit IV

Biometrical genetics- definition and concept; Variability types & method of assessment, gene effects i.e. additive, dominance and epistasis; Genotype x Environment interaction and its significance in crop improvement

Books recommended

-
- Principles and procedures of Plant Breeding by G.S. Chahal and S.S. Gosal
 - Principles of Cultivar Development: Theory and Technique (Vol. 1) by Walter R. Fehr.
 - Plant Breeding Principles and methods by B.D. Singh
 - Handbook of Agriculture Compiled by S.S. Singh, Kalyani Publishers, New Delhi
 - Vegetable Breeding-Principles and Practices –Hari Har Ram
 - Breeding Tropical and Subtropical Fruits-P. K. Ray
-

BSAG-605 Environmental Science and Disaster Management

Unit-I

Environment - basic concepts scope and importance. Natural Resources - renewable and non-renewable resources and their sustainable utilization. Ecosystem concepts - types, structure and functions of ecosystem. Pollution of water, air, soil, noise, thermal and nuclear hazard. Types, causes, methods of measurement, standards and management

Unit-II

Solid and liquid waste management - treatment and disposal. Vulnerability, adaptability and sustainable development; International conventions and treaties. Biodiversity and conservation - value, utilization and threats

Unit-III

Threatened/endangered species and hotspots. Human population and environment - environment and human health. Environment management laws and conservation projects of Government of India. Climate change - history and future projections, greenhouse gases, effects and mitigation strategies

Unit-IV

Natural Disasters - causes, phenomenon and impacts; Global and national events for disaster management; Agricultural Disaster phenomenon, events and their management; Acts and policies in India.

Books recommended

-
- Environmental Studies by Menakashi Verma
 - Text book of Environmental Studies by D.K.Asthana, Meena Asthana (S.Chand)
 - Disaster Management by Mukesh Kapoor
-

BSAG-606 Fundamentals of Agri-business Management

Unit I

Entrepreneurship Development Agri-business- meaning, definition, features and structure of agri-business (input, farm and processing sectors); Importance of agri-business in the Indian economy; Management- definitions, importance and functions.

Unit II

Planning- meaning, definition and process; Types of plans and characteristics of a sound plan; Introduction to organising, staffing, directing and controlling. Introduction to marketing management components of marketing mix.

Unit III

Project definitions; Project cycle- identification, formulation, appraisal, implementation, monitoring and evaluation. Entrepreneurship development- concept of entrepreneurship, entrepreneurial and managerial characteristics.

Unit IV

Overview of Indian social, political and economic systems and their implications for decision making by individual entrepreneurs; Procedure and constraints in setting up agro-based industries.

Books recommended

1. Objective Agribusiness management by S.R Panigrahy AMAZON INDIA
 2. Fundamentals of Agribusiness management by Shoji Lal Bairwa, Kalyani Publishers
 3. Agribusiness management by Jay T. Akridge, Freddie Barnard, Frank J. Dooley
-

BSAG-607 Protected Cultivation and Post-Harvest Technology

Unit-I

Introduction, planning, design and application of green houses; Plant response to greenhouse environment; Green house equipment.

Unit-II

Materials of construction for traditional and low cost green houses; Irrigation systems used in greenhouses; Cost estimation and economic analysis; Winnowing; Groundnut decorticators. Maize and castor shellers.

Unit-III

Drying- grain drying, types of drying, types of dryers. Storage grain storage, types of storage structures; Cleaning and grading equipment for fruits and vegetables; Size reduction equipment; Evaporation- principle and types; Quality standards.

Unit-IV

Crops selection and constraints of greenhouse cultivation; Growing media, drainage, flooding and leaching, soil pasteurization, nutrient film technique (NFT) / hydroponics.

Books recommended

1. Protected cultivation by Adikant Pardan
2. Advances in protected cultivation by Brahma Singh & Balraj Singh
3. Protected Cultivation of Horticultural Crops by D K Singh
4. Protected Cultivation of Vegetables by Balraj Singh

BSAG-608 Renewable Energy

UNIT-I

Energy sources- Introduction and classification. Types of biogas plants and utilization of biogas. Agricultural wastes.

UNIT-II

Principles of combustion, pyrolysis and gasification. Types of gasifiers. Producer gas and its utilization. Briquettes- briquetting machine, uses of briquettes.

UNIT-III

Solar energy- solar flat plate and focusing plate collectors. Introduction to solar air heaters, cookers, water heating systems, grain dryers, refrigeration system, ponds, lantern, street lights, fencing and pumping systems.

UNIT-IV

Wind energy- types and application of wind mills. Liquid bio fuels- biodiesel and ethanol from agricultural produce and its uses.

Books recommended

1. Renewable Energy sources & Emerging Technology by Kothari.
 2. Renewable Energy Technologies- A practical Guide for Beginners by Solanki.
 3. Renewable energy- Power for suitable future by Boyle
 4. Fundamentals of Renewable energy.
-
-

BSAG-609 Post-harvest Management of Fruits and Vegetables

Unit-I

Importance. Maturity indices, harvesting and post-harvest handling of fruits and vegetables; Maturity and ripening process. Factors affecting ripening and deterioration of fruits and vegetables.

Unit-II

Chemicals used for delaying and hastening ripening. Methods of storage and low cost storage structures.

Unit-III

Methods of packing, packaging materials and transport; Types of containers, cushioning material, vacuum packing, shrink packing.

Unit-IV

Specific packing for export of mango, banana, grapes, Kinnow, sweet orange, and mandarin etc. Unit layout - selection of site and precautions for hygienic conditions.

Books recommended

- Post harvest management of Horticulture Crops by Dr. S Saraswathy
- Post Harvest Technology Of Horticulture Crops by KP Sudeer.
- Prevention of Post harvest losses , Fruits, Vegetables and Root crops by FAO

BSAG-610 Crop Production-II (Rabi Crops) Practical

Crop planning; Raising field crops in multiple cropping systems using improved agronomic practices; Field preparation, seed treatment, nursery raising, sowing, nutrient management, water management, weed management and management of insect pests and diseases of crops. Harvesting, threshing, drying, winnowing, storage and marketing of produce; Preparation of balance sheet including cost of cultivation, net returns per student.

BSAG-611 Diseases of Horticultural Crops and their Management (Practical)

Study of symptoms and host-parasite relationships of important diseases of horticultural crops; Field visits at appropriate time during the semester

BSAG-612 Flower Cultivation and Landscape Gardening (Practical)

Identification of trees, shrubs, climbers, houseplants, seasonal flowers; Layout of lawns and maintenance; Potting, repotting and maintenance of houseplants; Training and pruning of rose; Pinching and disbudding chrysanthemum; Planning of gardens and development of garden features; Post-harvest handling of cut flowers

BSAG-613 Breeding of Field and Horticultural Crops (Practical)

Handling of segregating generations-pedigree method, bulk method, back cross methods; Field layout of experiments; Field trials; Estimation of heterosis and inbreeding depression; Estimation of heritability; GCA and SCA; Estimation of variability parameters; Problems on Hardy-Weinberg Law; Study of quality characters; Sources of donors for different characters; Visit to research stations and seed production and certification plots

BSAG-614 Protected Cultivation and Post Harvest Technology (Practical)

Study of different types of green houses; Calculation of air rate exchange system; Estimation of drying rate of agricultural products; Testing of soil and water suitability and fertigation requirements for greenhouses; Study of threshers, Winnowers, groundnut decorticator and maize and castor shellers - their components, operation and adjustments; Improved grain storage structures; Study of dryers, cleaners and graders. Visit to commercial greenhouses. Growing media - their preparation and pasteurization/sterilization

BSAG-615 Renewable Energy (Practical)

Constructional details of biogas plants; Constructional details of different types of gasifiers; To study and find the efficiency of solar cooker, dryers, domestic water heater; Performance of wind mills; Field visit to biogas plants and wind mills; Bio-diesel preparation

BSAG-616 Post-harvest Management of Fruits and Vegetables(Practical)

Judging maturity of various fruits and vegetables;. Conservation of zero energy cool chambers for on farm storage; Determination of physiological loss in weight, total soluble solids, total sugars, acidity and ascorbic acid content in fruits and vegetables; Types of packing and importance of ventilation; Pre cooling of horticultural crops; Methods of prolonging storage life; Effect of ethylene on ripening of fruits; Identification of equipments and machinery used in preservation of fruits and vegetables; Preservation by drying and dehydration. Visit to local market yards, cold storage units and packing house
