

For Batches 2019 & Onwards
Academic Autonomous Status vide letter No. F22-1/2014 (AC)

B. Sc. Agriculture (Honors) 1st Semester (2019 Onwards)

Contact Hours: 28 Hrs.

Course Code	Course Title	Load Allocation		Marks Distribution		Total Marks	Credits
		L	P	Internal	External		
BSAG-101-19	Fundamentals of Horticulture	1	0	40	60	100	1
BSAG-102-19	Fundamentals of Soil Science	2	0	40	60	100	2
BSAG-103-19	Introduction to Forestry	1	0	40	60	100	1
BSAG-104-19	Comprehension & Communication skills in English	1	0	40	60	100	1
BSAG-105-19	Fundamentals of Agronomy	2	0	40	60	100	2
BSAG-106-19 (A)	Introductory Biology*	2	0	40	60	100	2
BSAG-106-19 (B)	Elementary Mathematics**	2	0	40	60	100	2
BSAG-107-19	Agriculture Heritage	1	0	40	60	100	1
BSAG-108-19	Rural Sociology & Educational Psychology	1	0	40	60	100	1
BSAG-109-19	Human Values & Ethics	1	0	Satisfactory / Un Satisfactory			Non- Credit
BSAG-110-19	Fundamentals of Horticulture (Practical)	0	2	20	30	50	1
BSAG-111-19	Fundamentals of Soil Science (Practical)	0	2	20	30	50	1
BSAG-112-19	Introduction to Forestry (Practical)	0	2	20	30	50	1
BSAG-113-19	Comprehension & Communication skills in English (Practical)	0	2	20	30	50	1
BSAG-114-19	Fundamentals of Agronomy (Practical)	0	2	20	30	50	1
BSAG-115-19	Introductory Biology (Practical)	0	2	20	30	50	1
BSAG-116-19	NSS/NCC/Physical Education & Yoga Practices	0	2	Satisfactory / Un Satisfactory			Non- Credit
Total		14	14	480	720	1200	19

***Remedial course for students who had studied non- medical in 10+2**

****Remedial Course for students who had studied medical in 10+2**

For Batches 2019 & Onwards
Academic Autonomous Status vide letter No. F22-1/2014 (AC)

B. Sc. Agriculture (Honors) 2nd Semester (2019 Onwards)

Contact Hours: 24 Hrs.

Course Code	Course Title	Load		Marks Distribution		Total	Credits
		Allocation		Internal	External		
		L	P				
BSAG-201-19	Fundamentals of Genetics	2	0	40	60	100	2
BSAG-202-19	Agricultural Microbiology	1	0	40	60	100	1
BSAG-203-19	Soil and Water Conservation Engineering	1	0	40	60	100	1
BSAG-204-19	Fundamentals of Crop Physiology	1	0	40	60	100	1
BSAG-205-19	Fundamentals of Agricultural Economics	2	0	40	60	100	2
BSAG-206-19	Fundamentals of Plant Pathology	3	0	40	60	100	3
BSAG-207-19	Fundamentals of Entomology	3	0	40	60	100	3
BSAG-208-19	Fundamentals of Agricultural Extension Education	2	0	40	60	100	2
BSAG-209-19	Communication Skills and Personality Development	1	0	40	60	100	1
BSAG-210-19	Fundamentals of Genetics (Practical)	0	2	20	30	50	1
BSAG-211-19	Agricultural Microbiology (Practical)	0	2	20	30	50	1
BSAG-212-19	Soil and Water Conservation Engineering (Practical)	0	2	20	30	50	1
BSAG-213-19	Fundamentals of Crop Physiology (Practical)	0	2	20	30	50	1
BSAG-214-19	Fundamentals of Plant Pathology (Practical)	0	2	20	30	50	1
BSAG-215-19	Fundamentals of Entomology (Practical)	0	2	20	30	50	1
BSAG-216-19	Fundamentals of Agricultural Extension Education (Practical)	0	2	20	30	50	1
BSAG-217-19	Communication Skills and Personality Development (Practical)	0	2	20	30	50	1
	Total	16	16				24

***Remedial course for students who had studied non- medical in 10+2,**

****Remedial Course for students who had studied medical in 10+2**

BSAG-101-19 Fundamentals of Horticulture

L T P
1 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Horticulture - Its definition and branches, importance and scope; horticultural and botanical classification; climate and soil for horticultural crops; Plant propagation-methods and propagating structures; Seed dormancy, Seed germination, principles of orchard establishment; Principles and methods of training and pruning, juvenility and flower bud differentiation; unfruitfulness; pollination, pollinizers and pollinators; fertilization and parthenocarpy; medicinal and aromatic plants; importance of plant bio-regulators in horticulture. Irrigation – methods, Fertilizer application in horticultural crops.

BSAG-102-19 Fundamentals of Soil Science

L T P
2 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Soil as a medium of growth, Pedological and edaphological concepts of soil; Soil genesis: soil forming rocks and minerals; weathering, processes and factors of soil formation; Soil Profile, components of soil; Soil physical properties: soil-texture, structure, density and porosity, soil colour, consistence and plasticity; Elementary knowledge of soil taxonomy, classification, soils of India; Soil water retention, movement and availability; Soil air, composition, gaseous exchange, problem and plant growth, Soil temperature: source, amount and flow of heat in soil; effect on plant growth, Soil reaction-pH, soil acidity and alkalinity, buffering, effect of pH on nutrient availability; soil colloids- inorganic and organic; silicate clays: constitution and properties; sources of charge; ion exchange, cation exchange capacity, base saturation; soil organic matter: composition, properties and its influence on soil properties; humic substances - nature and properties; soil organisms: macro and micro organisms, their beneficial and harmful effects; Soil pollution - behaviour of pesticides and inorganic contaminants, prevention and mitigation of soil pollution.

BSAG-103-19 Introduction to Forestry

L T P
1 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Introduction – definitions of basic terms related to forestry, objectives of silviculture, forest classification, salient features of Indian Forest Policies. Forest regeneration, Natural regeneration -natural regeneration from seed and vegetative parts, coppicing, pollarding, root suckers; Artificial regeneration – objectives, choice between natural and artificial regeneration, essential preliminary considerations. Crown classification. Tending operations – weeding, cleaning, thinning – mechanical, ordinary, crown and advance thinning. Forest mensuration – objectives, diameter measurement, instruments used in diameter measurement; measurement of volume of felled and standing trees, age determination of trees. Agro forestry – definitions, importance, criteria of selection of trees in agro forestry, different agro forestry systems prevalent in the country, shifting cultivation, taungya, alley cropping, wind breaks and shelter belts, home gardens. Cultivation practices of two important fast growing tree species of the region. Rejuvenation of forest trees.

BSAG-104-19 Comprehension and Communication Skills in English

L T P
1 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

War Minus Shooting- The sporting Spirit. A Dilemma- A layman looks at science Raymond B. Fosdick. You and Your English – Spoken English and broken English G.B. Shaw. Reading Comprehension, Vocabulary- Antonym, Synonym, Homophones, Homonyms, often confused words. Exercises to help the students in the enrichment of vocabulary. Functional grammar: Articles, Prepositions, Verb, Subject verb Agreement, Transformation, Synthesis, Direct and Indirect Narration. Written Skills: Paragraph writing, Precise writing, Report writing and Proposal writing. The Style: Importance of professional writing. Preparation of Curriculum Vitae and Job applications. Synopsis Writing. Interviews: kinds, Importance and process.

BSAG-105-19 Fundamentals of Agronomy

L T P
2 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Agronomy and its scope, seeds and sowing, tillage and tilth, crop density and geometry, Crop nutrition, manures and fertilizers, nutrient use efficiency, water resources, soil-plant-water relationship, crop water requirement, water use efficiency, irrigation- scheduling criteria and methods, quality of irrigation water and its measurement. Weeds- importance, classification, crop-weed competition, concepts of weed management; principles and methods, allelopathy. Growth and development of crops, factors affecting growth and development, plant ideotypes, crop rotation and its principles, adaptation and distribution of crops, harvesting and threshing of crops.

BSAG-106-19(A) Introductory Biology

L T P
2 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Introduction to the living world, diversity and characteristics of life, origin of life, Evolution and Eugenics. Binomial nomenclature and classification Cell and cell division. Morphology of flowering plants. Seed and seed germination. Plant systematic- viz; Brassicaceae, Fabaceae and Poaceae. Role of animals in agriculture

BSAG-106-19(B) Elementary Mathematics

L T P
2 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Straight lines: Distance formula, section formula (internal and external division), Change of axes (only origin changed), Equation of co-ordinate axes, Equation of lines parallel to axes, Slope-intercept form of equation of line, Slope-point form of equation of line, Two point form of equation of line, Intercept form of equation of line, Normal form of equation of line, General form of equation of line, Point of intersection of two st. lines, Angles between two st. lines, Parallel lines, Perpendicular lines, Angle of bisectors between two lines, Area of triangle and quadrilateral. Circle: Equation of circle whose centre and radius is known, General equation of a circle, Equation of circle passing through three given points, Equation of circle whose diameters is line joining two points (x_1, y_1) & (x_2, y_2) , Tangent and Normal to a given circle at given point (Simple problems), Condition of tangency of a line $y = mx + c$ to the given circle $x^2 + y^2 = a^2$. Differential Calculus: Definition of function, limit and continuity, Simple problems on limit, Simple problems on continuity, Differentiation of x^n , e^x , $\sin x$ & $\cos x$ from first principle, Derivatives of sum, difference, product and quotient of two functions, Differentiation of functions of functions (Simple problem based on it), Integral Calculus: Integration of simple functions, Integration of Product of two functions, Matrices and Determinants: Definition of Matrices, Addition, Subtraction, Multiplication, Transpose and Inverse up to 3rd order, Properties of determinants up to 3rd order and their evaluation.

BSAG-107-19 Agricultural Heritage

L T P
1 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Introduction of Indian agricultural heritage; Ancient agricultural practices, Relevance of heritage to present day agriculture; Past and present status of agriculture and farmers in society; Journey of Indian agriculture and its development from past to modern era; Plant production and protection through indigenous traditional knowledge; Crop voyage in India and world; Agriculture scope; Importance of agriculture and agricultural resources available in India; National agriculture setup in India; Current scenario of Indian agriculture; Indian agricultural concerns and future prospects.

BSAG-108-19 Rural Sociology & Educational Psychology

L T P
1 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Sociology and Rural sociology: Definition and scope, its significance in agriculture extension, Social Ecology, Rural society, Social Groups, Social Stratification, Culture concept, Social Institution, Social Change & Development. Educational psychology: Meaning & its importance in agriculture extension. Behavior: Cognitive, affective, psychomotor domain, Personality, Learning, Motivation, Theories of Motivation, Intelligence.

BSAG-109-19 Human Value and Ethics

L T P
1 0 0

Satisfactory / Unsatisfactory

Values and Ethics-An Introduction. Goal and Mission of Life. Vision of Life. Principles and Philosophy. Self Exploration. Self Awareness. Self Satisfaction. Decision Making. Motivation. Sensitivity. Success. Selfless Service. Case Study of Ethical Lives. Positive Spirit. Body, Mind and Soul. Attachment and Detachment. Spirituality Quotient. Examination.

BSAG-110-19 Fundamentals of Horticulture (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Identification of garden tools. Identification of horticultural crops. Preparation of seed bed/ nursery bed. Practice of sexual and asexual methods of propagation including micro-propagation. Layout and planting of orchard. Training and pruning of fruit trees. Preparation of potting mixture. Fertilizer application in different crops. Visits to commercial nurseries/orchard.

BSAG-111-19 Fundamentals of Soil Science (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Study of soil profile in field, Study of soil sampling tools, collection of representative soil sample, its processing and storage, Study of soil forming rocks and minerals, Determination of soil density, moisture content and porosity, Determination of soil texture by feel and Bouyoucos Methods, Studies of capillary rise phenomenon of water in soil column and water movement in soil, Determination of soil pH and electrical conductivity, Determination of cation exchange capacity of soil, Study of soil map, Determination of soil colour, Demonstration of heat transfer in soil, Estimation of organic matter content of soil.

BSAG-112-19 Introduction to Forestry (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Identification of tree-species. Diameter measurements using calipers and tape, diameter measurements of forked, buttressed, fluted and leaning trees. Height measurement of standing trees by shadow method, single pole method and hypsometer. Volume measurement of logs using various formulae, age determination of trees, Nursery lay out, seed sowing, vegetative propagation techniques. Forest plantations and their management. Visits of nearby forest based industries

BSAG-113-19 Comprehension and Communication Skills in English (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Listening Comprehension: Listening to short talks lectures, speeches (scientific, commercial and general in nature). Oral Communication: Phonetics, stress and intonation, Conversation practice. Conversation: rate of speech, clarity of voice, speaking and Listening, politeness & Reading skills: reading dialogues, rapid reading, intensive reading, improving reading skills. Mock Interviews: testing initiative, team spirit, leadership, intellectual ability. Group Discussions and extempore

BSAG-114-19 Fundamentals of Agronomy (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Identification of crops, seeds, fertilizers, pesticides and tillage implements, study of agro-climatic zones of India, Identification of weeds in crops, Methods of herbicide and fertilizer application, Study of yield attributing characters and yield estimation, Seed germination and viability test, Numerical exercises on fertilizer requirement, plant population, herbicides and water requirement, Use of tillage implements- reversible plough, one way plough, harrow, leveler, seed drill, Study of soil moisture measuring devices, Measurement of field capacity, bulk density and infiltration rate, Measurement of irrigation water.

BSAG-115-19 Introductory Biology (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Morphology of flowering plants – root, stem and leaf and their modifications. Inflorescence, flower and fruits. Cell, tissues & cell division. Internal structure of root, stem and leaf. Study of specimens and slides. Description of plants - Brassicaceae, Fabaceae and Poaceae.

BSAG-116-19 NSS / NCC / Physical Education and Yoga Practices

L T P
0 0 2

Satisfactory / Unsatisfactory

1. Teaching of skills of Football/basketball/kabaddi/badminton/table tennis/yoga – demonstration, practice of the skills, correction, involvement in game situation, teaching of rules of the game (For girls teaching of Tennikoit)
2. Teaching – Meaning, Scope and importance of Physical Education
3. Teaching – Definition, Type of Tournaments
4. Teaching – Physical Fitness and Health Education
5. Construction and laying out of the track and field (*The girls will have Tennikoit and Throw Ball).

BSAG201-19 Fundamentals of Genetics

L T P
2 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Pre and Post Mendelian concepts of heredity, Mendelian principles of heredity. Architecture of chromosome; chromonemata, chromosome matrix, chromomeres, centromere, secondary constriction and telomere; special types of chromosomes. Chromosomal theory of inheritance- cell cycle and cell division- mitosis and meiosis. Probability and Chi-square. Dominance relationships, Epistatic interactions with example.

Multiple alleles, pleiotropism and pseudoalleles, Sex determination and sex linkage, sex limited and sex influenced traits, Blood group genetics, Linkage and its estimation, crossing over mechanisms, chromosome mapping. Structural and numerical variations in chromosome and their implications, Use of haploids, dihaploids and doubled haploids in Genetics. Mutation, classification, Methods of inducing mutations & CIB technique, mutagenic agents and induction of mutation. Qualitative & Quantitative traits, Polygenes and continuous variations, multiple factor hypothesis, Cytoplasmic inheritance. Genetic disorders. Nature, structure & replication of genetic material. Protein synthesis, Transcription and translational mechanism of genetic material, Gene concept: Gene structure, function and regulation, Lac and Trp operons.

BSAG202-19 Agricultural Microbiology

L T P
1 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Introduction. Microbial world: Prokaryotic and eukaryotic microbes. Bacteria: cell structure, chemoautotrophy, photo autotrophy, growth. Bacterial genetics: Genetic recombination transformation, conjugation and transduction, plasmids, transposon.

Role of microbes in soil fertility and crop production: Carbon, Nitrogen, Phosphorus and Sulphur cycles. Biological nitrogen fixation- symbiotic, associative and asymbiotic. Azolla, blue green algae and mycorrhiza. Rhizosphere and phyllosphere. Microbes in human welfare: silage production, biofertilizers, biopesticides, biofuel production and biodegradation of agro-waste.

BSAG203-19 Soil and Water Conservation Engineering

L T P
1 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Introduction to Soil and Water Conservation, causes of soil erosion. Definition and agents of soil erosion, water erosion: Forms of water erosion. Gully classification and control measures. Soil loss estimation by universal Loss Soil Equation. Soil loss measurement techniques. Principles of erosion control: Introduction to contouring, strip cropping. Contour bund. Graded bund and bench terracing. Grassed water ways and their design. Water harvesting and its techniques. Wind erosion: mechanics of wind erosion, types of soil movement. Principles of wind erosion control and its control measures.

BSAG204-19 Fundamentals of Crop Physiology

L T P
1 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Introduction to crop physiology and its importance in Agriculture; Plant cell: an Overview; Diffusion and osmosis; Absorption of water, transpiration and Stomatal Physiology; Mineral nutrition of Plants: Functions and deficiency symptoms of nutrients, nutrient uptake mechanisms; Photosynthesis: Light and Dark reactions, C₃, C₄ and CAM plants; Respiration: Glycolysis, TCA cycle and electron transport chain; Fat Metabolism: Fatty acid synthesis and Breakdown; Plant growth regulators: Physiological roles and agricultural uses, Physiological aspects of growth and development of major crops: Growth analysis, Role of Physiological growth parameters in crop productivity.

BSAG205-19 Fundamentals of Agricultural Economics

L T P
2 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Economics: Meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro and macro economics, positive and normative analysis. Nature of economic theory; rationality assumption, concept of equilibrium, economic laws as generalization of human behavior. Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare. Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development. Agricultural planning and development in the country.

Demand: meaning, law of demand, schedule and demand curve, determinants, utility theory; law of diminishing marginal utility, equi-marginal utility principle. Consumer's equilibrium and derivation of demand curve, concept of consumer surplus. Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity.

Production: process, creation of utility, factors of production, input output relationship. Laws of returns: Law of variable proportions and law of returns to scale. Cost: concepts, short run and

long run cost curves. Supply: Stock v/s supply, law of supply, schedule, supply curve, determinants of supply, elasticity of supply. Market structure: meaning and types of market, basic features of perfectly competitive and imperfect markets. Price determination under perfect competition; short run and long run equilibrium of firm and industry, shut down and break even points. Distribution theory: meaning, factor market and pricing of factors of production. Concepts of rent, wage, interest and profit.

National income: Meaning and importance, circular flow, concepts of national income accounting and approaches to measurement, difficulties in measurement.

Population: Importance, Malthusian and Optimum population theories, natural and socioeconomic determinants, current policies and programmes on population control. Money: Barter system of exchange and its problems, evolution, meaning and functions of money, classification of money, supply, general price index, inflation and deflation. Banking: Role in modern economy, types of banks, functions of commercial and central bank, credit creation policy.

BSAG206-19 Fundamentals of Plant Pathology

L T P
3 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Introduction: Importance of plant diseases, scope and objectives of Plant Pathology. History of Plant Pathology with special reference to Indian work. Terms and concepts in Plant Pathology. Pathogenesis. Causes/factors affecting disease development: disease triangle and tetrahedron and classification of plant diseases. Important plant pathogenic organisms, different groups: fungi, bacteria, fastidious vesicular bacteria, phytoplasmas, spiroplasmas, viruses, viroids, algae, protozoa, phanerogamic parasites and nematodes with examples of diseases caused by them. Diseases and symptoms due to abiotic causes.

Fungi: general characters, definition of fungus, somatic structures, types of fungal thalli, fungal tissues, modifications of thallus, reproduction (asexual and sexual). Nomenclature, Binomial system of nomenclature, rules of nomenclature, classification of fungi. Key to divisions, subdivisions, orders and classes.

Bacteria and mollicutes: general morphological characters. Basic methods of classification and reproduction.

Viruses: nature, structure, replication and transmission. Study of phanerogamic plant parasites. *Nematodes*: General morphology and reproduction, classification, symptoms and nature of damage caused by plant nematodes (*Heterodera*, *Meloidogyne*, *Anguina*, *Radopholus* etc.) Growth and reproduction of plant pathogens. Liberation / dispersal and survival of plant pathogens. Types of parasitism and variability in plant pathogens. Pathogenesis. Role of enzymes, toxins and growth regulators in disease development. Defense mechanism in plants. Epidemiology: Factors affecting disease development. Principles and methods of plant disease management. Nature, chemical combination, classification, mode of action and formulations of fungicides and antibiotics.

BSAG207-19 Fundamentals of Entomology

L T P
3 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

History of Entomology in India. Major points related to dominance of Insecta in Animal kingdom. Classification of phylum Arthropoda upto classes. Relationship of class Insecta with other classes of Arthropoda. Morphology: Structure and functions of insect cuticle and molting.

Body segmentation. Structure of Head, thorax and abdomen. Structure and modifications of insect antennae, mouth parts, legs, Wing venation, modifications and wing coupling apparatus. Structure of male and female genital organ. Metamorphosis and diapause in insects. Types of larvae and pupae. Structure and functions of digestive, circulatory, excretory, respiratory, nervous, secretory (Endocrine) and reproductive system, in insects. Types of reproduction in insects. Major sensory organs like simple and compound eyes, chemoreceptor.

Insect Ecology: Introduction, Environment and its components. Effect of abiotic factors—temperature, moisture, humidity, rainfall, light, atmospheric pressure and air currents. Effect of biotic factors – food competition, natural and environmental resistance.

Systematics: Taxonomy –importance, history and development and binomial nomenclature. Definitions of Biotype, Sub-species, Species, Genus, Family and Order. Classification of class Insecta upto Orders, basic groups of present day insects with special emphasis to orders and families of Agricultural importance like Orthoptera: Acrididae, Tettigonidae, Gryllidae, Gryllotalpidae; Dictyoptera: Mantidae, Blattidae; Odonata; Isoptera: Termitidae; Thysanoptera: Thripidae; Hemiptera: Pentatomidae, Coreidae, Cimicidae, Pyrrhocoridae, Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidae, Aleurodidae, Pseudococcidae; Neuroptera: Chrysopidae; Lepidoptera: Pieridae, Papilionidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Saturnidae, Bombycidae; Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidae, Bruchidae, Scarabaeidae; Hymenoptera: Tenthredinidae, Apidae. Trichogrammatidae, Ichneumonidae, Braconidae, Chalcididae; Diptera: Cecidomyiidae, Tachinidae, Agromyziidae, Culicidae, Muscidae, Tephritidae.

BSAG208-19 Fundamentals of Agricultural Extension Education

L T P
2 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Education: Meaning, definition & Types; Extension Education- meaning, definition, scope and process; objectives and principles of Extension Education; Extension Programme planning- Meaning, Process, Principles and Steps in Programme Development. Extension systems in India: extension efforts in pre-independence era (Sriniketan, Marthandam, Firka Development Scheme, Gurgaon Experiment, etc.) and post-independence era (Etawah Pilot Project, Nilokheri Experiment, etc.); various extension/ agriculture development programmes launched by ICAR/Govt. of India (IADP, IAAP, HYVP, KVK, IVLP, ORP, ND,NATP, NAIP, etc.). New trends in agriculture extension: privatization extension, cyber extension/ e-extension, market-led extension, farmer-led extension, expert systems, etc.

Rural Development: concept, meaning, definition; various rural development programmes launched by Govt. of India. Community Dev.-meaning, definition, concept & principles, Philosophy of C.D. Rural Leadership: concept and definition, types of leaders in rural context; extension administration: meaning and concept, principles and functions. Monitoring and evaluation: concept and definition, monitoring and evaluation of extension programmes; transfer of technology: concept and models, capacity building of extension personnel; extension teaching methods: meaning, classification, individual, group and mass contact methods, ICT Applications in TOT (New and Social Media), media mix strategies; communication: meaning and definition; Principles and Functions of Communication, models and barriers to communication. Agriculture journalism; diffusion and adoption of innovation: concept and meaning, process and stages of adoption, adopter categories.

BSAG209-19 Communication Skills and Personality Development

L T P
1 0 0

Internal Marks: 40
External Marks: 60
Total Marks: 100

Communication Skills: Structural and functional grammar; meaning and process of communication, verbal and nonverbal communication; listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures.

Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting; individual and group presentations, impromptu presentation, public speaking; Group discussion. Organizing seminars and conferences.

BSAG210-19 Fundamentals of Genetics (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Study of microscope. Study of cell structure. Mitosis and Meiosis cell division. Experiments on monohybrid, dihybrid, trihybrid, test cross and back cross, Experiments on epistatic interactions including test cross and back cross, Practice on mitotic and meiotic cell division, Experiments on probability and Chi-square test. Determination of linkage and cross-over analysis (through two point test cross and three point test cross data). Study on sex linked inheritance in *Drosophila*. Study of models on DNA and RNA structures.

BSAG211-19 Agricultural Microbiology (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Introduction to microbiology laboratory and its equipments; Microscope- parts, principles of microscopy, resolving power and numerical aperture. Methods of sterilization. Nutritional media and their preparations. Enumeration of microbial population in soil- bacteria, fungi, actinomycetes. Methods of isolation and purification of microbial cultures. Isolation of Rhizobium from legume root nodule. Isolation of Azotobacter from soil. Isolation of Azospirillum from roots. Isolation of BGA. Staining and microscopic examination of microbes.

BSAG212-19 Soil and Water Conservation Engineering (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

General status of soil conservation in India. Calculation of erosion index. Estimation of soil loss. Measurement of soil loss. Preparation of contour maps. Design of grassed water ways. Design of contour bunds. Design of graded bunds. Design of bench terracing system. Problem on wind erosion.

BSAG213-19 Fundamentals of Crop Physiology (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Study of plant cells, structure and distribution of stomata, imbibitions, osmosis, plasmolysis, measurement of root pressure, rate of transpiration, Separation of photosynthetic pigments through paper chromatography, Rate of transpiration, photosynthesis, respiration, tissue test for mineral nutrients, estimation of relative water content, Measurement of photosynthetic CO₂ assimilation by Infra Red Gas Analyser (IRGA).

BSAG214-19 Fundamentals of Plant Pathology (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Acquaintance with various laboratory equipments and microscopy. Collection and preservation of disease specimen. Preparation of media, isolation and Koch's postulates. General study of different structures of fungi. Study of symptoms of various plant diseases. Study of representative fungal genera. Staining and identification of plant pathogenic bacteria. Transmission of plant viruses. Study of phanerogamic plant parasites.

Study of morphological features and identification of plant parasitic nematodes. Sampling and extraction of nematodes from soil and plant material, preparation of nematode mounting.

BSAG215-19 Fundamentals of Entomology (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

Methods of collection and preservation of insects including immature stages; External features of Grasshopper/Blister beetle; Types of insect antennae, mouthparts and legs; Wing venation, types of wings and wing coupling apparatus. Types of insect larvae and pupae; Dissection of digestive system in insects (Grasshopper); Dissection of male and female reproductive systems in insects (Grasshopper); Study of characters of orders Orthoptera, Dictyoptera, Odonata, Isoptera, Thysanoptera, Hemiptera, Lepidoptera, Neuroptera, Coleoptera, Hymenoptera, Diptera and their families of agricultural importance.

BSAG216-19 Fundamentals of Agricultural Extension Education (Practical)

L T P
0 0 2

Internal Marks: 20
External Marks: 30
Total Marks: 50

To get acquainted with university extension system. Group discussion- exercise; handling and use of audio visual equipments and digital camera and LCD projector; preparation and use of AV aids, preparation of extension literature – leaflet, booklet, folder, pamphlet news stories and success stories; Presentation skills exercise; micro teaching exercise; A visit to village to understand the problems being encountered by the villagers/ farmers; to study organization and functioning of DRDA and other development departments at district level; visit to NGO and learning from their experience in rural development; understanding PRA techniques and their application in village development planning; exposure to mass media: visit to community radio and television studio for understanding the process of programme production; script writing, writing for print and electronic media, developing script for radio and television.

BSAG217-19 Communication Skills and Personality Development (Practical)

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Internal Marks: 20
External Marks: 30
Total Marks: 50

Listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures. Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting; individual and group presentations.