B.Sc (Hons) Agriculture

India is a land of agriculture and for many decades country’s major occupation lacked specialized and modern techniques. This necessity originates the need of the innovative attitude. The usage of upgraded instruments and techniques help to upsurge the need and desire to upgrade the agriculture system and bring more awareness and better infrastructure to boost agriculture profession in India. The various courses in Agriculture are designed to help student understand the modules of agriculture, the environment, marketing skills etc. Moreover the course is designed in such a way that the student would also get knowledge about the management, conservation and expansion of the forests as it is the need of the hour not only from resource point of view but also from the point of view of environment.

Eligibility Criteria: 10+2 in Science or equivalent in any stream

To earn a B.Sc (Agriculture), a student has to earn a minimum of 120 credits. Min 60 credits to be earned from general science subjects, Min 30 credits from Forestry subjects and remaining can be taken from any stream

Every student has to attain a minimum of D grade in all courses; a student may however, and repeat or change any course being offered. Notwithstanding, every student must acquire the desired number of credits. The detailed course structure under different categories is given in succeeding pages. Brief description of the course content follows thereafter.
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Credit 4  

13A.102 Introduction to Computer Applications  
Credit 4  

13A.103 Fundamental of Horticulture  
Credit 4  
Content: Importance and scope of Horticulture in India with special reference to U.P. Classification of fruits based on soil and climate, Layout of an orchard, Propagation techniques of fruit plants, Principles and methods of pruning and training, Irrigation of fruit trees, Macro and Micro-nutrients use in orcharding

13A.104 Introductory Agriculture  
Credit 4  
Content: History of Agricultural development in India, Factors affecting crop production, Soil factors, Social and economic factors, Diversity in physiographic, Soil groups, Dry and irrigated agriculture, Farming systems approach, Value addition, Requirements in new, technology and research, Role of women in Agriculture.

13A.105 Fundamental of Soil, Water and Conservation Engineering  
Credit 4  

13A.106 Elementary Maths  
Credit 4  
Content: Theory of quadratic, Binomial-Theorem (for +ve index), Use of natural & common logarithms, exponential series, partial-fractions, Determinants of order 3,
Theory of Matrices, addition, subtraction, multiplication, transpose, elementary ideas on adjoint & inverse. Solution of linear equations, inequalities, permutation & combination.
Coordinate-Geometry: Distance between two points, Area of triangle, Straight-lines.

13A.107 Introductory Nematology
Credit 4

13A.108 Statistics
Credit 4
Content: Introduction: Definition of Statistics and its use and limitations; Frequency Distribution and Frequency Curves; Measures of Central Tendency Mean, Median, Mode, Measures of Dispersion Probability: Sampling, Correlation: Correlation Linear Regression: of Y on X and X on Y.

13A.109 Water Management Including Micro Irrigation
Credit 4
Content: Irrigation: definition and objectives, water resources and irrigation development in India and Rajasthan; Soil plant water relationships; Methods of soil moisture estimation, evapotranspiration and crop water requirement; effective rainfall, scheduling of irrigation; Methods of irrigation: surface, sprinkler and drip irrigation; Irrigation efficiency and water use efficiency, conjunctive use of water, irrigation water quality and its management. Water management of different crops (rice, wheat, maize, groundnut, sugarcane, mango, banana and tomato); Agricultural drainage.

13A.110 Dimensions of Agricultural Extension
Credit 4

13A.111 Principles of Agricultural Economics
Credit 4

13A.112 Livestock Production and Management
Credit 4
Content: Place of livestock in the national economy, different livestock development programmes of Govt. of India. Important exotic and Indian breeds of cattle, buffalo, sheep, goat and swine. Measures and factors affecting fertility in livestock, reproductive behaviour like oestrus, parturition, farrowing etc. Milk secretion, milking of animals and factors affecting milk yield and composition. Selection and breeding of livestock for higher milk and meat production. Feeding and management of calves, growing heifers and milk animals and other classes and types of animals, housing principles, space requirements for different species of livestock. Disease control measures, incubation, hatching and brooding, vaccination and prevention of diseases, preservation and marketing of eggs, its economics and keeping quality. Cost of production of milk, economical units of cattle, buffalo, sheep, goat and swine.

13A.201 Agricultural Microbiology
Credit 4
13A.202 Principles of Genetics
Credit 4
Content: Mendel’s laws of inheritance and exceptions to the laws; Types of gene action, Multiple alleles, Pleiotropism, Penetrance and expressivity; Quantitative traits, Qualitative traits and differences between them; Multiple factor hypothesis; Cytoplasmic inheritance, it’s characteristic features and difference between chromosomal and cytoplasmic inheritance; Mutation and it’s characteristic features; Methods of inducing mutations and CIB technique. Gene expression and differential gene activation; Lac operon and Fine structure of Gene; Ultra structure of cell and cell organelles and their functions; Study of chromosome structure, morphology, number and types, Karyotype and Idiogram; Mitosis and meiosis, their significance and differences between them; DNA and it’s structure, function, types, modes of replication and repair. RNA and its structure function and types.

13A.203 Environmental Science
Credit 4

13A.204 Principles of Plant Breeding
Credit 4
Content: Classification of plants, Botanical description, Floral biology, Emasculation and Pollination techniques in cereals, millets, pulses, oil seeds, fibers, plantation crops etc. Aims and objectives of Plant Breeding; Modes of reproduction, Sexual, Asexual, Apomixis and their classification; Significance in plant breeding; Modes of pollination, genetic consequences, differences between self and cross pollinated crops; Methods of breeding – introduction and acclimatization. Selection, Mass selection Johannson’s pure line theory, genetic basis, pure line selection; Hybridization, Aims and objectives, types of hybridization; Methods of handling of segregating generations, pedigree method, bulk method, back cross method and various modified methods; Incompatibility and male sterility and their utilization in crop improvement; Heterosis, inbreeding depression, various theories of Heterosis, exploitation of hybrid vigor development of inbred lines, single cross and double cross hybrids; Population improvement programmes.

13A.205 Manures, Fertilizers and Agro-Chemicals
Credit 4

13A.206 Agricultural Finance and Co-Operation
Credit 4

13A.207 Production Technology of Vegetables and Flowers
Credit 4

13A.208 Production Technology of Fruit Crops
Credit 4
Content: Definition and importance of horticulture. Divisions of horticulture. Climatic zones of horticulture crops. Area and production of different fruit crops. Selection of site, fencing, and wind break, planting systems, high density planting, planning and establishment. Propagation methods and use of rootstocks. Methods of training and pruning. Use of growth regulators in fruit production. Package of practices for the
cultivation of major fruits – mango, banana, citrus, grape, guava, sapota, apple, litchi. Papaya, Minor fruits – pineapple, annonaceous fruits, pomegranate, ber, fig, phalsa, jack, pear, plum, peaches and cherry.

13A.209 Insect Ecology and Integrated Pest Management
Credit 4


13A.210 Agricultural Marketing, Trade and Prices
Credit 4


13A.211 Field Crops-I (Kharif)
Credit 4

Content: Origin, geographic distribution, economic importance, soil and climatic requirement, varieties, cultural practices and yield of kharif crops, Cereals—rice, maize, sorghum, pearl millet and minor millets; Pulses: pigeonpea, mungbean and urdbean; Oilseeds: groundnut, sesame and soybean; Fibre crops: cotton, jute and sunhemp; and Forage crops: sorghum, maize, cowpea, cluster bean and napier.

13A.212 Field Crops- II (Rabi)
Credit 4

Content: Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of rabi crops; Cereals: wheat, barley; Pulses: chickpea, lentil, peas, french bean; Oilseeds: rapeseed and mustard, sunflower,
safflower and linseed; Sugar crops: sugarcane and sugarbeet, Medicinal and aromatic crops such as mentha, lemon grass, citronella, palma rosa, isabgol and posta; Commercial crops: potato and tobacco, Forage crops: berseem, lucerne and oat.

13A.301 Production Technology of Spices, Aromatic, Medicinal and Plantation Crops
Credit 4

Content: Importance and cultivation technology of Spices – ginger, turmeric, pepper, cardamom, coriander, cumin, fenugreek; Aromatic crops – lemon grass, citronella, palmarose, vetiver, geranium, dawana; Plantation crops – coconut, arecanut, betelvine, cashew, cocoa, coffee, oilpalm; Medicinal plants – diascoria, rauvolfia, opium, ocimum, perwinkle, aloe, guggul, belladonna, nuxvomica, Solanum khasiamum, aonla, senna, plantago, stevia, coleus and Acorus.

13A.302 Plant Pathogens and Principles of Plant Pathology
Credit 4


13A.303 Biochemistry
Credit 4

13A.304 Farming Systems and Sustainable Agriculture
Credit 4
Content: Sustainable agriculture: Introduction, definition, goal and current concepts, factors affecting ecological balance and ameliorative measures; Land degradation and conservators of natural resources, LEIA & HEIA; Irrigation problems, waste lands and their development; Organic farming: definition, principles and components; Farming systems: definition, principles and components, IFS models for wetland, irrigated dryland and dryland situations.

13A.305 Crop Pests, Stored Grain Pests and their Management
Credit 4
Content: Stored grain pests: Coleopteran and Lepidopteran pests, their biology and damage, preventive and curative methods. Distribution, biology, nature and symptoms of damage, and management strategies of insect and non insect pests of rice, sorghum, maize, ragi (Eleucine coracana), wheat, sugarcane, cotton, mesta, sunhemp, pulses, groundnut, castor, gingerly, safflower, sunflower, mustard, brinjal, bhendi, tomato, cruciferous and cucurbitaceous vegetables, potato, sweet potato, colocasia, moringa, amaranthus, chillies, mango, citrus, grapevine, cashew, banana, pomegranate, guava, sapota, ber, apple, coconut, tobacco, coffee, tea, turmeric, betelvine, onion, coriander, garlic, curry leaf, pepper, ginger and ornamental plants.

13A.306 Diseases of Field Crops and their Management
Credit 4
Content: Economic importance, symptoms, cause, epidemiology and disease cycle and integrated management of diseases of rice, sorghum, bajra, maize, wheat, sugarcane, turmeric, tobacco, groundnut, sesamum, sunflower, cotton, redgram, bengalgram, blackgram, greengram, tea, soybean.

13A.307 Diseases of Horticultural Crops and their Management
Credit 4
Contents: Economic Importance, symptoms, cause, disease cycle and integrated management of diseases of citrus, mango, banana, grapevine, pomegranate, papaya, guava, sapota, apple, chilli, brinjal, bhendi, potato, crucifers, cucurbits, tomato, beans, onion, coconut, oil palm, betelvine, mulberry, coffee, tea, rose, chrysanthemum and jasmine.

13A.308 Production Economics and Farm Management
Credit 4
planning and budgeting. Risk and uncertainty. Farm budgeting. Linear programming: Assumptions, Advantages and Limitations of Linear programming.

**13A.309 Organic Farming**  
Credit 4  
**Content:** Introduction, concept, relevance in present context; Organic production requirements; Biological intensive nutrient management-organic manures, vermicomposting, green manuring, recycling of organic residues, biofertilizers; Soil improvement and amendments; Integrated diseases and pest management – use of biocontrol agents, biopesticides pheromones, trap crops, bird perches; Weed management; Quality considerations, certification, labeling and accreditation processors, marketing, exports.

**13A.310 Weed Management**  
Credit 4  
**Content:** Weeds: Introduction, harmful and beneficial effects, classification, propagation and dissemination; Weed biology and ecology, crop weed association, crop weed competition and allelopathy Concepts of weed prevention, control and eradication; Methods of weed control: physical, cultural, chemical and biological methods. Integrated weed management; Herbicides: advantages and limitation of herbicide usage in India, Herbicide classification, formulations, methods of application; Introduction to Adjuvants and their use in herbicides; Introduction to selectivity of herbicides; Compatibility of herbicides with other agro chemicals; Weed management in major field and horticultural crops, shift of weed flora in cropping systems, aquatic and problematic weeds and their control.

**13A.311 Rainfed Agriculture**  
Credit 4  
**Contents:** Definition, problems, characteristics, drought, mechanism of drought tolerance, agro-techniques for boosting crop yields, water and moisture harvesting. Selection of crops and varieties, Studies of mulches

**13A.312 Remote Sensing and GIS Application**  
Credit 4  
**Contents:** Remote Sensing: Definition, stage in remote sensing, modern remote sensing technology versus conventional aerial photography; visual image interpretation, image interpretation, basic principles of image interpretation, factors governing the quality of an image; factors governing interpretability, visibility of objects, elements of image interpretation, techniques of image interpretation, digital image processing, digital image; remote sensing in agriculture progress and prospects, microwave radiometry for monitoring agriculture crops and hydrologic forecasting; aerial photo interpretation for water resources development and soil conservation survey. GIS: History of development of GIS definition, basic components, and standard GIS packages.