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.

Codes	Subject Name	Credit
13A.101	Principles of Agronomy and Agricultural Meteorology	4
13A.102	Introduction to Computer Application	4
13A.103	Fundamental of Horticulture	4
13A.104	Introductory Agriculture	4
13A.105	Fundamentals of Soil, Water and Conservation Engineering	4
13A.106	Elementary Maths	4
13A.107	Introductory Nematology	4
13A.108	Statistics	4
13A.109	Water Management Including Micro Irrigation	4
13A.110	Dimensions of Agricultural Extension	4
13A.111	Principles of Agricultural Economics	4
13A.112	Livestock Production and Management	4
13A.201	Agricultural Microbiology	4
13A.202	Principles of Genetics	4
13A.203	Environmental Science	4
13A.204	Principles of Plant Breeding	4
13A.205	Manures, Fertilizers and Agro-Chemicals	4
13A.206	Agricultural Finance and Co-Operation	4
13A.207	Production Technology of Vegetables and Flowers	4
13A.208	Production Technology of Fruit Crops	4
13A.209	Insect Ecology and Integrated Pest Management	4
13A.210	Agricultural Marketing, Trade and Prices	4
13A.211	Field Crops-I (Kharif)	4
13A.212	Field Crops- II (Rabi)	4
13A.301	Production Technology of Spices, Aromatic, Medicinal and Plantation Crops	4
13A.302	Plant Pathogens and Principles of Plant Pathology	4
13A.303	Biochemistry	4
13A.304	Farming Systems and Sustainable Agriculture	4
13A.305	Crop Pests and Stored Grain Pests and their Management	4
13A.306	Diseases of Field Crops and their Management	4
13A.307	Diseases of Horticultural Crops and their Management	4
13A.308	Production Economics and Farm Management	4
13A.309	Organic Farming	4
13A.310	Weed Management	4
13A.311	Rainfed Agriculture	4
13A.312	Remote Sensing and GIS Application	4

13A.101 Principles of Agronomy and Agricultural Meteorology
Credit 4
Content: Meaning and scope of Agronomy: Planting geometry and its effect on growth and yield cropping systems, Harvesting Agricultural meteorology: Weather and climate, micro-climate, weather elements. Earths' atmosphere. Composition and structure, global warming. Air Pressure variations; Wind: factors affecting, cyclones and anticyclones and general circulation. Basics of weather forecasting.

13A.102 Introduction to Computer Applications
Credit 4
Content: Introduction to computers: History, evolution, Memory & Input / Output / Storage Devices. Software: Type of software, System software, Applications Software, Introduction to Ms-Word and Ms-Excel. Operating Systems: Definition, functions of Operating System. Booting process of computer-warm and cold. Introduction to DOS and Windows Operating System. Computer Viruses: Types of computer viruses, worms, Trojans, Security Aspects.

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
Content: Survey equipment, chain survey, cross staff survey, plotting procedure, calculations of area of regular and irregular fields. Leveling – leveling equipment, terminology, methods of calculation of reduced levels, types of leveling, contouring. Irrigation, flow irrigation and lift irrigation. Water source, Water lifting devices. Water conveyance systems, open channel and underground pipeline. Irrigation methods – drip and sprinkle irrigation systems. Soil and water conservation – soil erosion, types and engineering control measures.

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 ad joint & inverse. Solution of linear equations, inequalities, permutation & combination. Trigonometry: Trignometrical – functions, addition & subtraction formula, double & half angle formula laws of sines & cosines, solutions of triangles, height & distance, real & complex-numbers, hyperbolic trigonometric functions. De-Movier's Theorem. Coordinate-Geometry: Distance between two points, Area of triangle, Straight-lines.

13A.107 Introductory Nematology

Credit 4

Content: Introduction: History of phytonematology. Economic importance. General characteristics of plant pathogenic nematodes. Nematode general morphology and biology. Classification of nematodes upto family level with emphasis on groups containing economically important genera. Classification of nematodes by habitat. Identification of economically important plant nematodes upto generic level with the help of keys and description. Symptoms caused by nematodes with examples. Interaction between plant parasitic nematodes and disease causing fungi, bacteria and viruses.

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

Content: Education – Meaning, Definition, Extension Education and Agricultural Extension – Meaning, Definition, Concepts, Rural development, Developmental programmes of pre-independence era. Development programmes of Post independence era. Community Development Programme Education, National Extension service. Panchayat Raj system Agricultural Development Programmes. District Programme (IADP), High Yielding Varieties Programme (HYVP), Institution Village Linkage Programme (IVLP), Watershed Development Programme (WDP), National Agricultural Technology Project (NATP), ATMA, ATIC. Social Justice and Poverty alleviation programmes – Integrated Tribal Development Agency (ITDA), Integrated Rural Development Programme (IRDP), Swarna Jayanthi Gram Swarojgar Yojana (SGSY),

Prime Minsiter Employment Yojana (CMEY). New trends in extension, privatization. Women Development programmes – Development of Women and Children in Rural Areas (DWCRA).

13A.111 Principles of Agricultural Economics

Credit 4

Content: Economics: Meaning, Definition, Subject matter, Divisions of Economics, Importance of Economics; Agricultural Economics: Meaning, Definition; Basic Concepts: Goods, Service, Utility, Value, Price, Wealth, Welfare. Theory of consumption: Law of Diminishing Marginal utility, Consumer's surplus: Meaning, Definition, and Importance. Demand: Meaning, Definition, Kinds of Demand, Demand schedule, Demand Curve, Law of Demand, Extension and Contraction Vs Increase and Decrease in Demand. Elasticity of Demand, Factors influencing elasticity of Demand, Importance of Elasticity of Demand. Welfare Economics: Meaning, Pareto's optimality. National Income: Concepts, Measurement. Public Finance: Meaning, Principles. Public Resource: Meaning, Services Tax, Meaning, And Classification of Taxes: Cannons of Taxation, Public expenditure, Principles. Inflation

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

Content: History of Microbiology: Spontaneous generation theory, Role of microbes in fermentation, Germ theory of disease, Protection against infections, Applied areas of Microbiology Metabolism in bacteria: ATP generation, chemoautotrophy, photo autotrophy, respiration, fermentation. Bacteriophages: structure and properties of Bacterial viruses – Lytic and Lysogenic cycles: viroids, prions. Bacterial genetics; Gene expression; Genetic recombination: transformation, conjugation and transduction, genetic engineering, Plasmids, episomes, genetically modified Organisms. Soil Microbiology: Microbial groups in soil, microbial transformations of carbon, nitrogen, phosphorus and sulphur, Biological nitrogen fixation. Microflora of Rhizosphere and Phyllosphere microflora, microbes in composting. Microbiology of Water. Microbiology of food: microbial spoilage and principles of food preservation. Beneficial microorganisms in Agriculture.

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 C l B 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
Content: Scope and importance of environmental studies. Natural resources: Renewable and renewable resources. Forest, Water, Food, energy and land resources. Ecosystems: Definition, concept, structure and functions. Producers, consumers and decomposers of an ecosystem. Energy flow in the ecosystem. Types of ecosystems. Bio-diversity: Definition, classification, threats to biodiversity and its conservation. Environmental pollution: Causes, effects and control of air, water, soil, thermal, noise and marine pollution. Causes, effects and management of soil nuclear hazards and industrial wastes. Disaster management, Floods, earthquakes, cyclones and land slides. Social issues and the environment, unsustainable to sustainable development. The Environment Protection Act, The Air Act, The water Act, The Wildlife Protection. Act and Forest Conservation Act. Woman and child welfare.

13A.204Principles 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

Content: Introduction – Raw materials – Manures – Bulky and concentrated – FYM, Composts – Different methods, Mechanical compost plants, Vermicomposting, Green manures, Oil cakes, Sewage and sludge – Biogas plant slurry, Plant and animal refuges. Fertilizers – classifications, Manufacturing processes and properties of major nitrogenous (ammonium sulphate, urea, calcium ammonium nitrate, ammonium nitrate, ammonium sulphate nitrate) phosphatic (single super phosphate, enriched super phosphate, diammonium phosphate, ammonium poly phosphate), potassic and complex fertilizers their fate and reactions in the soil, Secondary and micronutrients fertilizers, Amendments. Fertilizer Control Order, Fertilizer storage; Biofertilizers and their advantage, Organic chemistry as prelude to agro chemicals, Diverse types of agrochemicals, Botanical insecticides (Neem), Pyrethrum, Synthetic pyrethroids.

13A.206 Agricultural Finance and Co-Operation

Credit 4

Content: Agricultural finance: nature and scope Agricultural credit: meaning, definition, need, classification. Credit analysis: 4R's 5C's and 7 P's of Credit, repayment plans. History of financing agriculture in India. Commercial banks, Nationalization of commercial banks. Lead bank scheme, regional rural banks, scale of finance. Higher financing agencies, RBI, NABARD, AFC, Asian Development Bank, World Bank, Insurance and Credit Guarantee Corporation of India. Assessment of crop losses, determination of compensation. Crop insurance, advantages and limitations in application, estimation of crop yields. Agricultural cooperation: pre-independence and post independence periods, cooperation in different plan periods, cooperative credit structure: PACS, FSCS. Re-organization of cooperative credit structure.

13A.207 Production Technology of Vegetables and Flowers

Credit 4

Content: Importance of Olericulture, vegetable gardens, vegetable classification. Origin, area, production, varieties, package of practices for fruit vegetables –, tomato, brinjal, chillies, and okra; Cucurbitaceous vegetables cucumber, ridge gourd, ash gourd, snake gourd, bottle gourd, bitter gourd and melons, Cole crops – cabbage, cauliflower and knol-khol. Bulb crops – onion and garlic. Beans and peas – French beans, cluster beans, dolichos beans, peas and cowpea. Tuber crops potato, sweet potato, tapioca, colocasia, yams; Root crops – carrot, radish, turnip and beet root; Leafy vegetables – amaranthus, palak, gogu; Perennial vegetables – drumstick, coccinia and curry leaf. Importance of ornamental gardens. Planning of ornamental gardens. Types and styles of ornamental gardens. Use of trees, shrubs, climbers, palms, houseplants and seasonal flowers in the gardens.

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

Content: 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. Concepts of Balance of life in nature, Pest surveillance and pest forecasting. Categories of pests. Study of important insecticides. Botanical insecticides – neem based products, Cyclodiens, Organophosphates, Novel insecticides, Pheromones, Nicotinyl insecticides, Chitin synthesis inhibitors, Phenyl pyrazoles, Avermectins, Macrocyclic lactones, Oxadiazimes, Thiourea derivaties, pyridine azomethines, pyrroles, etc. Nematicides, Rodenticides, Acaricides and fumigants. Recent methods of pest control, Practices, scope and limitations of IPM. Insecticides Act 1968 – Important provisions. Application techniques of spray fluids.

13A.210 Agricultural Marketing, Trade and Prices

Credit 4

Content: Agricultural Marketing: Concepts and Definition, Scope and subject matter, Meaning, Definitions, Components of a market, Classification. Market structure, Conduct, performance. Marketing structure, Market functionaries or agencies, Producer's surplus: Meaning, Types of producers surplus, marketable surplus. Marketed surplus, importance, Factors affecting Marketable surplus. Marketing channels: Meaning, Definition, Channels for different products. Market integration, Meaning, Definition, Types of Market Integration. Marketing efficiency: Marketing costs, Margins and price spread, , Reasons for higher marketing costs of farm commodities, Ways of reducing marketing costs. Theories of International Trade: Domestic Trade, Free trade, International Trade, Cooperative Marketing. State Trading. Ware Housing Corporation. Food Corporation of India: Objectives and Functions. Quality Control, Agricultural Products, AGMARK.

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

Content: Introduction, Important plant pathogenic organisms, different groups, phytoplasmas, spiroplasmas, viruses, viriods, algae, protozoa and phanerogamic Prokaryotes: classification of prokaryotes. General Characters of fungi, Definition of fungus, somatic structures, types. reproduction in fungi . Nomenclature, Binomial system of nomenclature, rules of nomenclature, Introduction: Definition and objectives of Plant Pathology. History of Plant Pathology. Plant disease epidemiology. Plant Disease Forcasting – Remote sensing – General principles of plant diseases management. Cultural methods – Rougeing, eradication of alternate and collateral hosts, crop rotation, manure and fertilizer management. Time of sowing, seed rate and plant density, Role and mechanisms of biological control and PGPR. Physical Methods – Heat and Chemical methods.

13A.303 Biochemistry

Credit 4

Content: Biochemistry – Introduction and importance. Plant cell, cell wall and its role in live stock, food and paper industries. Bio-molecules – Structure, properties &applications: Amino acids, peptides and proteins –Plant proteins and their quality. Enzymes –Factors affecting the activity, classification, Immobilistion and other industrial applications. Lipids –Acyl lipids, Their industrial application in soaps, detergents, paints, Varnishes, lubricants, adhesives, plastics, nylon, Bio-diesel, Biodegradable plastics etc. Carbohydrates; Nucleotides and Nucleic acids. Metabolic energy and its generation – Metabolism – Basic concepts, Glycolysis, Citric acid Cycle, Pentose phosphate pathway, oxidative phosphorylation, Fatty acid oxidation. General reactions of amino acid degradation. Biosynthesis – carbohydrates, Lipids, Proteins and Nucleic acids. Metabolic regulation. Secondary metabolites, Terpenoids, Alkaloids, Phenolics and their applications in food and pharmaceutical industries.

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, colacasia, 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
Content: Production Economics: Meaning, Definition, Nature and Scope of Agricultural Production Economics. Basic concepts and terms. Concepts of Production. Production Functions: Meaning, Definition, Types. Laws of returns: Increasing, Constant and decreasing. Factor Product Relationship. Determination of optimum input and output. Factor relationship. Product relationship. Types of enterprise relationships. Returns to scale: Meaning, Definition, and Importance. Farm Management. Economic principles applied to the Organizations of farm business. Types and systems of farming. Farm

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.