

LUCKNOW UNIVERSITY LUCKNOW
B.Sc. (Honours) Agriculture N E P Semester II Syllabus

Semester-II

B.Sc.(Honours) Agriculture Semester –II
Fifth Dean Committee Syllabus
NEP

SEMESTER-WISE DISTRIBUTION OF COURSES

SEMESTER: II

Sl. No. of Paper	Course code	Theory Paper Code	Course title	Credit hours	Mark Distribution			
					T	I	P	Total
1.	AG-201	16201	Fundamentals of Crop Physiology	3(2+1)	50	20	30	100
2.	AG-202	16202	Fundamentals of Plant Biochemistry	3(2+1)	50	20	30	100
3.	AG-203	16203	Fundamentals of Entomology-I	3(2+1)	50	20	30	100
4.	AG-204	16204	Fundamentals of Agricultural Economics	2(2+0)	80	20	-	100
5.	AG-205	16205	Principles of Organic Farming	2(1+1)	50	20	30	100
6.	AG-206	16206	Fundamentals of Plant Pathology	4(3+1)	50	20	30	100
7.	AG-207	16207	Production Technology for Vegetables and Spices	2(1+1)	50	20	30	100
8.	AG-208	16208	Fundamentals of Agricultural Extension Education	3(2+1)	50	20	30	100
9.	AG-209	16209	Dairy Processing and Safety Issues	3(2+1)	50	20	30	100
10	AG-210	162010	Human Values & Ethics	1(1+0)	80	20	-	100
Total Credit				26 Credit				
T= Theory, I= Internal, P= Practical								

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Mark Distribution		
Theory 50 Marks	Internal 20 Marks	Practical 30 Marks

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SEM II

AG-201: Fundamentals of Crop Physiology 3(2+1)

Theory

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.

Practical

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).

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AG-202.: Fundamentals of Plant Biochemistry 3(2+1)

Theory

Biochemistry-introduction, scope and Importance in agriculture. Carbohydrate: Importance and classification of Monosaccharides, Disaccharides and Polysaccharides. Lipid: Importance and classification; Structures and properties of fatty acids; lipids. Proteins: Importance of proteins and classification; Structures. Amino acid-definition, calcification and important function. Structural organization of proteins. Enzymes: General properties; Classification; Mechanism of action; classification of vitamin structure role and its deficiency symptoms. Introduction to allosteric enzymes. Nucleic acids: Importance and classification; Structure of Nucleotides. Metabolism of carbohydrates: Glycolysis.

Practical

Qualitative tests of carbohydrates and amino acids. Quantitative estimation of glucose/ proteins. Titration methods for estimation of amino acids/lipids, Paper chromatography Monosaccharides. Estimation of Ca, CaO and CaCO₃ in HCl extract. Estimation of reducing and non reducing in cane sugar and jaggary.

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AG-203: FUNDAMENTALS OF ENTOMOLOGY-I **3(2+1)**
(INSECT MORPHOLOGY & TAXONOMY)

Theory

Classification of phylum Arthropoda upto classes. Relationship of class Insecta with other classes of Arthropoda. Morphology: Structure and functions of insect cuticle and moulting. 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 organs. Metamorphosis and diapause in insects. Types of larvae and pupae. Structure and functions of digestive, circulatory, excretory, respiratory, nervous, secretory (Endocrine) and reproductive systems in insects. Types of reproduction in insects. Major sensory organs like simple and compound eyes and chemoreceptors. 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. Dictyoptera: Mantidae, Odonata; Isoptera: Termitidae; Thysanoptera: Thripidae; Hemiptera: Pentatomidae, Coreidae, Cimicidae, Pyrrhocoridae. Lygaeidae, Cicadellidae, Delphacidae, Aphididae, Coccidae, Lophophidac, Alcuroidac, Pseudococcidae; Neuroptera: Chrysopidae; Lepidoptera: Pieridae, Papiloinidae, Noctuidae, Sphingidae, Pyralidae, Gelechiidae, Arctiidae, Saturnidae, Bombycidae; Coleoptera: Coccinellidae, Chrysomelidae, Cerambycidae, Curculionidac, Bruchidae, Scarabaeidae; Hymenoptera: Tenthridinidae, Apidae. Trichogrammatidae, ichneumonidae, Braconidae, Chalcididae; Diptera: Cecidomyiidae, Tachinidae, Agromyziidae, Culicidae, Muscidae, Tephritidae.

Practical

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.

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Theory 80 Marks	Internal 20 Marks	---- NIL

AG-204: Fundamentals of Agricultural Economies 2 (2+0)

Theory

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, demand schedule and demand curve, determinants, utility theory: law of diminishing marginal utility, equimarginal 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. Supply: Stock Ws supply, law of supply, supply schedule, supply curve, determinants of supply, elasticity of supply. 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, money supply, general price index, inflation and deflation, public revenue and public expenditure. Tax: meaning. direct and indirect taxes, agricultural taxation, VAT. Economic systems: Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning.

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AG-205: Principles of Organic Farming **2(1+1)**

Theory

Organic farming, principles and its scope in India; Initiatives taken by Government (central/state), NGOs and other organizations for promotion of organic agriculture. Organic nutrient resources and its fortification; Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming; Fundamentals of insect, pest, disease and weed management under organic mode of production: Certification process and standards Of organic farming.

Practical

Visit of organic farms to study the various components and their utilization: Preparation of enrich compost, vermin compost, Indigenous technology knowledge (ITK) for nutrient, insect, pest disease and weed management; Cost of organic production system; Quality aspect, grading, packaging and handling.

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AG-206: Fundamentals of Plant Pathology **4(3+1)**

Theory

Introduction: Importance of plant diseases, scope and objective of Plant Pathology. History of Plant Pathology with special reference to Indian work. Terms and concept in Plant Pathology. Pathogenesis. diseases triangle and tetrahedron and classification of plant diseases. Important Plant pathogenic organism fungi. bacteria. fastidious vesicular bacteria. Phytoplasmas, Spiro plasmas, viruses. viroids, algae. protozoa, phanerogamic parasite and nematodes with example of diseases caused by them. Diseases due to abiotic causes.

Fungi: general character, definition of fungus, somatic structures, type of fungus thalli, fungal tissues. modifications of thallus, reproduction (Asexual and Sexual). Nomenclature, Binomial system of nomenclature. rules of nomenclature, classification of fungi, key to divisions, sub-divisions. orders and classes.

Bacteria and mollicutes: general morphological characters, basic methods reproduction. Viruses: nature of properties, structure and transmission. Study of phanerogamic plant parasites. Epidemiology: Factors affecting disease development.

Practical

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 structure of fungi, study of symptoms of various plant diseases. Study of representative fungal genera. Staining and identification of plant pathogenic bacteria. Study of phanerogamic plant parasites. Identification of plant parasitic nematodes.

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AG-207 Production Technology for Vegetable and Spices **2(1+1)**

Theory

Importance of vegetables & spices in human nutrition and national economy, types of vegetable gardening brief about origin, area, production improved varieties and cultivation practices such as time of sowing, transplanting techniques, planting distance, fertilizer requirements, irrigation, weed management, harvesting storage, physiological disorders, disease and seed production of important vegetable (potato, tomato, cauliflower, onion, okra, bottle guard and bitter guard) and spices i.e. condiments. Ginger, turmeric, coriander, cumin, fennel, black pepper, ilaichi.

Practical

Identification of vegetables & spice crops and their seeds. Nursery raising. Direct seeds sowing and transplanting. Study of morphological characters of different vegetables & spices. Fertilizer applications raising of nursery of vegetable & spices, vegetable and spices seed extraction. Harvesting & preparation for market. Economics of vegetables and spices cultivation.

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AG-208: Fundamentals of Agricultural Extension Education **3(2+1)**

Theory

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, Martbandam, 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/ eextension, 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. extension administration: meaning and concept, principles and functions. Monitoring and evaluation: concept and definition, 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.

Practical

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.

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AG-209: Dairy Processing and Safety Issues **3(2+1)**

Theory

GENERAL : Definition of food, Constituents of foods : Water, Carbohydrate, Fat, Protein, Vitamins and Minerals with reference to milk, Detailed composition of milk and colostrum. **FOOD PROCESSING** : Pasteurization, Sterilization, Bactofugation, Uperization, Stassanization. U.H.T. pasteurization and Homogenization of milk, Neutralization of milk, Cream, Cooling and chilling of milk. Manufacturing of common dairy product viz. Cream, Butter, Ghee, Dahi, Yoghurt, Shrikhand & Ice-cream. Manufacturing of Khoa, Evaporated milk, condensed milk, WMP, SMP, Paneer, Cheese, Chhena, Cheddar cheese and. Mozzarella cheese (Pizza cheese). **FOOD SAFETY** : Definition, Importance, Scope, Hazards and risks. Food safety management, HACCP, ISO Series, TQM-Concept and need for quality component of TQM. Basic water tests.

Practical

1. Demostration of Cream separation.
2. Preparation of indigenous dairy products viz. Dahi. Chhena.Khoa, Paneer, Cream, Ghee, shrikhand.
3. Water quality analysis.
4. Problem on neutralization of milk and cream.
5. Preparation of plants for implementation of HACCP and ISO series,
6. Problems on over run.
7. Calculation of Ice cream mix.

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AG210: Human Value and Ethics **1(1+0)**

Theory

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. Course title: