COURSE CONTENTS
B.Sc. (Ag) Fourth Year Odd Semester

S. No.	Course Title	Credit Hrs	Theory		Practical	Total
			Ex.	Int.		
1.	General Economics	2+0	35	15	0	50
2.	Breeding and Improvement of farm Animals	2+1	35	15	25	75
3.	Principles of Animal Nutrition	2+1	35	15	25	75
4.	Element of Food Technology	2+1	35	15	25	75
5.	Human Food and Nutrition	2+1	35	15	25	75
6.	Soil Taxonomy, Survey and Remote Sensing	2+1	35	15	25	75
7.	Production Technology of Medical and Aromatic Plants	2+1	35	15	25	75
Total		**14+6=20**	**245**	**105**	**150**	**500**

Paper I: General Economics

Nature, scope and subject matter of economics, approaches to economic analysis and nature of economic theory, basic terms and concepts; law of demand, determinants of demand, price, cross pricing and income elasticity of demand and their application; law of diminishing marginal utility and principle of equi-marginal utility, consumer's equilibrium and derivation of demand curve, factors of production and input-output relationships, law of variable proportions and laws of scale, cost concepts, law of supply, determinants of supply, elasticity of supply, firm's equilibrium and market equilibrium in short run and long run, features of perfectly competitive market, price determination under perfect competition, basic features of monopoly, duopoly, oligopoly, and monopolistic competition meaning of distribution, factor market and pricing of factors of production.

Importance of national income, concepts of national income, approaches of measuring nation income, difficulties and limitations of nation income accounting, importance of population studies, determinants of population,, theories of population, barter system of exchange and its problems, classification of money and concepts of money supply, quantity theory of money, Inflation & deflation. Role of bank money in modern economy, types of banks and their function, cre3dit creation by commercial banks, functions of central bank and instruments of credit control, current changes in banking, concept of economy and economic system, basic feature of capitalistic, socialist and mixed economic systems, elements of economic planning, international trade, its need and importance, theories of absolute and comparative advantage, exchange rate, TOT, BOP, devaluation of currency, recent developments in world trade.

Special characteristics of agriculture and its role in economic development. Agricultural planning and development in the country. Role of women in Indian Agriculture.

Paper II: Breeding and Improvement of Farm Animals

Reproductive systems of farm animals. Qualitative and quantitative inheritance and effect of environment on them. Various qualitative and quantitative traits of livestock. Gene frequency and forces affecting them. Random mating and Hardy -Weingberg's law, variation, its measures, genetic, phenotypic and environmental variances. Heritability and repeatability, its measurement and uses. Selection its genetic effect, selection for dominant and recessive gone and quantitative traits, selection differential, response to selection, generation interval and annual rate of gain. Genetic correlation and correlated response. Basis of selection, individual, family, progeny, pedigree and combined selection. Methods of selection for one or more traits- random, independent culling level and selection index. Inbreeding- its consequences, inbred lines, line breading, inbreeding coefficient and relationship coefficient, out breeding- various types of out crossing and cross-breeding, species hybridization and development of new breeds.

Practical:

Computation of mean, variance, standard deviation, correlation and regression coefficients, inbreeding coefficients and relationship coefficient in economic traits of livestock, estimation of gene frequency, repeatability and heritability in animal population.

Paper III: Principals of Animal Nutrition

Introduction to expanding field of nutrition, chemical composition of animal and its food, digestive system and processes of farm animals. Digestion, absorption and metabolism of carbohydrates, lipids and proteins in protein content in various classes of feeds. Concept of essential amino acids for non-ruminants and protein quality of feeds. The absorption and metabolism of essential minerals and vitamins, symptoms of their deficiencies, minerals and vitamin content of various classes of feeds. The nutritive evaluation of feeds for energy and protein, digestibility of feeds and partition of feed energy within animal, systems of expressing energy values of feeds, nutrient requirements of farm animals for maintenance, growth, reproduction and lactation. Substances for stimulating growth.

Practical

Study of plant cell, forages and fodders, cereals, cereal offal and oil cakes, animal, avain and marine offal, mineral and vitamin supplements and other feed additives. Least cost ration formulation, proximate analysis of feed samples for moisture, crude protein, crude fat, crude

fiber, ash, acid insoluble ash and nitrogen free extractive. Formulation of ration for cattle, buffaloes, sheep, goat, swine and poultry.

Paper IV: Elements of Food Technology

Scope and importance of food technology in Indian economy, Handling, transportation and storage of food grains, fresh milk, meat, fish and eggs; physical, chemical and nutritional characteristics of food grains, fresh meat fish, milk and eggs; role of milling and size reduction in food processing. Use of low temperatures in processing and storage of food grains, fresh milk, meat, fish and eggs; drying and dehydration of food grains and concentration and evaporation of milk; food fermentations and their application in food processing. Role of food additives in the processing of food grains, milk, meat, fish, eggs and their products; food irradiation and its application in extending shelf life of food grains, meat, fish, eggs and their products; food packaging and its function; by-products utilization and disposal of food industry wastes; quality control, total quality assurance(TQA) and various systems of TQA.

Practical

Milling of wheat and rice and testing quality of milled products, baking of bread, biscuits and cakes; physical and chemical properties of milk, separation of cream and ghee making, preparation of chhena, paneer, khoa, ice cream and cottage4 cheese. Slaughtering of poultry and pickling of culled meat. Preparation of meat kabab and patties. Evaluation and preservation of fresh eggs. Visit to food industries.

Paper V : Human Food and Nutrition

Trends in food production and consumption in India. Role of agricultural scientists and food technologist in meeting national nutritional requirements.

Definition of human nutrition, nutrient, nutritional care, health, Nutritional status and good nutrition. Food and its functions and functional classification. Calorific value of food and its measurement. Digestion and absorption of various nutrients present in food. Energy and nutrients needs of human body. Recommended dietary allowances for various age groups and classes of individuals. Common nutritional problems in India and their causes. Specific Nutritional deficiencies and disorders including protein calorie malnutrition, nutritional anaemias, vitamin deficiencies, obesity, atherosclerosis. Clinical symptoms and diagnoses of deficiency disorder. Important food groups and their role in the management of deficiency disorder and disease. Food habitat and their effect on regional balance. Balances diet and its formulation.

Food borne infection and food hygiene. Effect of processing on the nutritional value of foods. Applied nutritional programme in country, nutritional policies of foods fortification, enrichment and restoration, supplementary feeding programmes for vulnerable groups. State national and international agencies dealing with nutritional programmes.

Practical

Deierminition of proximate composition, pH, acidity, minerals and vitamins (B"B1, and C) in foods. Detection of adultration in various foods. Determination of calorific value of foods and formulation of balanced diets. Microbiological analysis of foods (SPC, coliform, and yeast and mould count). Signs of malnutrition in animals. Diagnosis of nutritional deficiency disorders in human being.

Paper VI: Soil Taxonomy, Soil Survey and Remote-Sensing

Types of soil survey, morphological, physical and chemical properties used in distinguishing and classifying soils. Principles of soil taxonomy, classification system. Soil of India and classification. Advantages of taxonomic classification of soils.

Remote sensing-introduction, definition, concept, principles, importance, scope, types, merits and demerits and its application in agriculture and soil classification.

Practical

Field visit and practice of judging soil texture gy feel method; examination of soil profile. Study of base maps for soil survey, village or cadastral maps, topographic maps, aerial photographs and use of stereoscope, satellite imagery. Examination of soil properties of some omportent soil of india. Aerial photographas, adjustment of stereoscope. Area estimation of eroded land from F.C.C (False colour composite). Visit of Remote Sensing application centre/soil survey organization.

Paper VII: Production Technology of Medicinal and Aromatic Plants

Importance and scope of medicinal and aromatic plants, geographical distribution of species, botanical description, management of nurseries, climate and relation to medicinal and aromatic plants, improved varieties, soil and land preparation, intercultural practices, irrigation and insect-past management, post harvest techniques, harvesting, processing, storage and herbage/constituent yield. The following medicinal and aromatic plants shall be covered.

Medicinal Plants: Sarpagendha, poppy, sadabahar, digitailis, dioscorea, solanum, brahmi, isabgol, senna, aloe, neem cinchona and lpecac.

Aromatic Plants: Essential oils: Mints-menthol mint, pepper mint, Spearmint, bergamot mint; Aromatic grasses-lemon grass, palmarosa, citronella, vetiver, ocimum, geranium, pahauli. Dill (sowa), cinnamon,pine eucalyptus, sandalwood, liquiorice.

Flower perfume: Lavender, rose, rosemerry, jasmine

Practical

Identification and preparation of herbarium techniques of sowing planting study of morphological and chemical characteristics yield techniques for quality analysis and visit to related research institutions drug farms and pharmaceutical industries involved in the cultivation and processing of medicinal and aromatic plants.