COURSE CONTENTS
B.Sc. (Ag) Second Year Even Semester

S. No.	Course Title	Credit Hrs	Theory		Practical	Total
			Ex.	Int.		
1.	Economic Entomology	2+1	35	15	25	75
2.	Introduction to Plant Biotechnology	1+1	35	15	25	75
3.	Field Crop II (Rabi)	2+1	35	15	25	75
4.	Agriculture Co-operation, Finance and Bust. Mgt.	2+1	35	15	25	75
5.	Insect pest and their Management	2+1	35	15	25	75
6.	Fruit and Plantation Crops	2+1	35	15	25	75
7.	Livestock Production	2+1	35	15	25	75
8.	Rain fed Agriculture	1+1	35	15	25	75
Total		**14+8=22**	**280**	**120**	**200**	**600**

Paper I. Economic Entomology

How insects become pest, economic importance of insects, classification of pests, principles and methods of pest control, viz, physical mechanical, cultural, legal, genetic & chemical. Biological principles and methods of insecticidal applications, Apiculture, Sericulture and lac cultivation with special reference to equipment used insects and diseases, production and marketing.

Practical

Insecticide formulation, application, equipment, their handling and maintenance. Identification of commonly available natural enemies, honesty bee, and lac insects species and their rearing visit to institutes to bee keeping, sericulture and lac insects.

Paper II. Introduction to Plant Biotechnology

Introduction: History of plant tissue culture and biotechnology, scope and importance of agricultural biotechnology, Gene technology and Tissue and cell culture: Media, various modes of culture and their application. Organ culture cell suspension culture, Callus culture, Micro propagation methods: Organogenesis and embryogenesis, their signification, Anther culture; haploid production, diploidization and their signification, Protoplasts isolation, fusion, somatic hybridization and hybrids, Somaclonal variation and its use in crop improvement, Germ plasm storage and cryopreservation, Secondary metabolite production, Introduction to genetic engineering, Gene technology. Gene transfer methods; Physical Chemical and Agro bacterium dependent methods, Generation of transgenic plants and their identification, Molecular markets, RGLP, RAPD, simple sequence repeats etc, Role of biotechnology in crop improvement.

Practical

Plant tissue culture laboratory working procedure, Preparation of nutrient culture medium. Study of different micro propagation approaches viz, meristem shoot tip culture, auxiliary bud etc. Organogenesis in tissue culture and other approaches.

Paper III. Field Crops II (Rabi)

Origin and geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of rabi crops; cereals wheat, barley and triticale; pulses-chickpea, lentil, peas, French bean; Oil seed; rapeseed and mustard, sunflower and linseed; sugar crops; sugarcane and sugar beet, Regional medicinal and aromatic crops such as mentha, lemon grass, citronella, palma rose, Isabgol and posts, potato and tobacco, Forage crops; berseem, Lucene and Oat.

Practical

Sowing of wheat, sugarcane and sunflower. Top dressing of nitrogen in wheat and study of fertilizer experiments on wheat and mustard. Identification of weeds in wheat and grain legumes, application of weedicides and study of weed control experiments. Morphological characteristics of wheat, sugarcane, chickpea and mustard. Yield contributing characters of wheat. Yield and quality analysis of sugarcane. Crop distribution in the state and the region, Important agronomic experiments of rabi crops and visit to research stations related to rabi crops.

Paper IV. Agricultural Cooperation, Finance and Business Management

Cooperation-Meaning, Signification under Indian agriculture conditions, objectives principles of cooperatives. Agricultural cooperation in India credit marketing, consumer and multi-purpose cooperative, farming co-operatives, processing cooperatives, cooperative warehousing, role of ICA,NCU,NCDC,NAFED etc. Women co-operatives.

Meaning, scope and signification of agriculture finance. Credit needs of Indian agriculture, economic principle in capital acquisition and use decisions, preparation and analysis of financial statements- balance sheet and income statement. Cost of credit. Access for women to agricultural credit facilities. Agricultural credit market- institutional and non institutional sources of credit cooperatives credit system, commercial banks and regional rural banks, NABARD and AFC, problems and issues in institutional agricultural credit system. Business management environment of agriculture business, tasks of a professional manager, management system and processes, types of management decisions, decision making techniques and processes, organizational culture and management ethics.

Practical

Acquaintance with balance sheet and profit & loss accounts. Estimation of credit requirement of farm, appraisal of the loan, interest and performance of cooperative, commercial banks and RRBs, analysis of the relevant publish data. Class seminars and discussion on selected topics. Visit of commercial bank, cooperative bank, agricultural cooperative societies and agri- business units in order to impart firsthand knowledge of their management and working.

Paper V. Insect pests and their Management

Nature and extent of damage, life cycle seasonal history, host range, distribution and management of the major insect pests attacking field drops; Cereals, pulses, oilseeds, fiber, sugar crops, Horticultural crops, Brinjal, okra, potato, tomato, cole crops, leguminous vegetable, cucurbits, chilies, sweet potato, leafy vegetables, onion and garlic, colocasia, yam, fruit crops (tropical/sub tropical); jack fruit, papaya, coconut and date palm, mango, citrus, litchi, banana, guava, peach, pear, plum, apricot, chestnut, almond, plantation and garden crops: narcotics, spices and condiments. Stored grain and household pests; Locust and other major poly phagous insects, Rodents and mites of agriculture importance.

Practical

Nature of damage, life cycle and seasonal cycle and seasonal cycle of insect pests attacking field, vegetable and crops including stored grains: rodents and mites, their nature of damage, life cycle and management. Visit to cold storage research and Training institute and Horticultural research station.

Paper VI. Fruit and Plantation crops

Importance and scope of fruit and plantation crop industries in India. Cultivation practices of important fruit and plantation crops with reference to their origin, soil and climatic requirement; botany, important cultivars, plant propagation practices, resource and planting .Care and management in respect of irrigation, nutrient deficiencies of fruit plant and their collection, inter cropping, major cultivation problem and their control measures, harvesting, yield, storage and marketing; application of plant bio regulators; post-harvest and technology of plantation crops. Management of major insect pests and disease, principles and methods of evaluation of fruit tree, project formulation and evaluation, commercial orchard.

Practical

Introduction of fruit plants-vernacular and botanical names, families, distinguishing vegetables, fruit characters, lifting and packing of fruit plants from nursery operation-lifting and shifting

plants, weeding and hoeing; orchard layout and planting; plant propagation; methods sexual and sexual; seed treatment, seed sowing and germination, planting; cuttings and preparation of stool beds, study of bud intake and success in manuring operation in the orchards, training and pruning of fruit plants, use of plant bio-regulators in fruit set, fruit drop, fruit growth and fruit ripening, harvesting, handling, sorting, grading, packing and storage. Visit to temperate fruit research station/tea nursery and garden.

Paper VII. Livestock Production

Place of livestock in the national economy, efficient livestock development programme of government of India, importance of exotic and Indian breeds of cattle, buffalo, sheep, goat and swine. Measures and factors affecting livestock fertility, reproduction behavior like oestrus, parturition, farrowing etc. Milk secretion, milking of animal and factors affecting milk yield and meat production. Feeding and management of calves, growing of heifers and milch animal and other classes and types of animal. Housing principles, space requirement for different species of livestock. Disease control and measures of measure livestock diseases, sanitation and care. Breeding feeding and production records.

Practical

Identification, handling and restraining of animal, judging and culling, feeding and ration formulation, visit to livestock forms, economics of livestock production.

Paper VIII. Rain fed Agriculture

History of rain fed agriculture, magnitude of its problem and delineating criteria for rain fed and dry lands, soil climatic condition prevalent in rain fed area. Water stress in relation to crop productivity, concept of crop productivity and plant type for rain fed farming areas and crop improvement for efficient water use, drought resistance in crop plants. Efficient utilization of water through soil and crop management practices; reducing water losses through mulching and use of anti-transpirants, their kinds, mode of action and effect on crop yield. Increasing water storage by reducing run off and increasing infiltration through mechanical and cultural measures, water harvesting techniques, watershed management. Efficient management of rain fed crops: land preparation, seeding and crop density, selection of efficient crops and their varieties, alternate cropping and land use strategies, soil fertility management and fertilizer use techniques, weed control and inter culture operation, mid season correction for mitigating the aberrant weather, agro techniques for hilly tracts.

Practical

Climatic conditions prevalent at the various dry land research centers of the country and delineating criteria for rain fed and dry lands; Pattern of rainfall in different dry land tracts of the country; onset and withdrawal of the monsoon, amount, intensity and distribution, and studies of the effective cropping season; critical analysis of rainfall and estimation of moisture index, probable seeding time possible drought period, crops and cropping systems for dry lands; practical utilities of mulches, their mode of application and effect on soil and crop growth; seedling emergence survival and initial growth of crops at different moisture regimes.

Seed soaking, seed treatment with chemicals and depth of seeding under moisture stress on emergence and seedling vigor, methods of fertilizer application in dry land areas; Effect of plant density, thinning, leaf removal under moisture stress condition on crop growth. Study of the salient features of a model water shed; methods of measurement and determination of run off; alternate land use strategies: Agro forestry, grass-legume forage and alley cropping system; visit to dry land research station and operational research projects to expose students to the latest agro techniques, and watershed management practices.