III B.Sc SEMESTER-VI Agriculture
Elective-I
Paper VII(A) – PRODUCTION TECHNOLOGY OF VEGETABLE CROPS
Total hours of teaching 45 hrs @ 3 hrs per week

Unit – I  
(9 hrs)

1. Importance of vegetable growing in India, production, productivity and distribution, nutritive value of vegetables, economic importance and scope of various vegetables in India, Export of vegetables
2. Classification of vegetables – types of classification and their bases – Botanical, cultural, thermo classification, classification based on parts used, based on soil acidity and duration
3. Factors affecting vegetable production – soil, climate, water, nutrients.

Unit – II  
(9 hrs)

1. Basic principles of vegetable production- Vegetable nursery, seed and seedlings production, transplanting, care and management; Irrigation requirements of vegetables – surface and sub surface irrigation, spray irrigation
2. Nutrition, essential nutrients, deficiency symptoms, methods of application
3. Types of vegetable gardens, nutrition garden, market garden, truck garden, vegetable forcing, vegetable garden for special purpose and processing, veg. gardens for seed production, riverbed system, terrace garden etc

Unit – III  
(9 hrs)

1. Role of growth regulators in vegetable production and methods of application
2. Problems in vegetable production; Plant protection- special precautions in vegetables, methods of control, crop rotation, resistant varieties, seed treatments, etc.
3. General principles of seed production in vegetables- rouging, isolation distance, seed purity, seed standards, – breeder seed, foundation seed, certified seed – packaging and seed storage, moisture and temperature
Unit – IV  
(9 hrs)

1. Cropping systems and patterns of vegetable based cropping system, vegetables in rice based and coconut based cropping system, intercropping, mixed cropping, relay cropping, multiple cropping, etc.
2. Organic farming in vegetables
3. Importance, origin, varieties, cultivation, seed production, problems and prospects of Tomato

Unit – V  
(9 hrs)

1. Importance, origin, varieties, cultivation, seed production, problems and prospects of Chilli
2. Importance, origin, varieties, cultivation, seed production, problems and prospects of Brinjal
3. Importance, origin, varieties, cultivation, problems and prospects of cucurbits

Suggested Readings

III B.Sc SEMESTER-VI Agriculture
Elective-I
Paper VII(A) – PRODUCTION TECHNOLOGY OF VEGETABLE CROPS
Total hours of teaching 30 hrs @ 2 hrs per week

Practical schedule

1. Familiarization of different vegetable crops- through field visits and slide show
2. Preparation of nursery plants, sowing and aftercare; portray seedling production- solanaceous vegetables
3. Layout of nutrition garden and preparation of crop calendar
4. Familiarization of seeds of vegetable crops
1. Visit to the farmer’s fields in the vegetable growing areas to study the field problems faced by the farmer and to work out the economics of vegetable cultivation

Practical Model Paper

1. Identification of Vegetables 20 Marks
2. Project report on farm visit 10 Marks
3. Interview schedule 10 Marks
4. Record & Viva 10 Marks

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Total = 50 Marks
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III B.Sc SEMESTER-VI Agriculture
Elective-II
Paper VII(B) – Manures, Fertilizers and Soil fertility management
Total hours of teaching 45 hrs @ 3 hrs per week

Unit – I (9 hrs)
1. Importance and scope of organic farming - Bulky organic manures/concentrated manures/liquid manures/green manures and green leaf manures.
2. Chemical fertilizers – classification-Nitrogenous fertilizers – Urea, Ammonium sulfate-manufacturing process, properties and use
3. Nitrogenous fertilizers – Sodium nitrate, ammonium chloride, calcium ammonium nitrate, ammonium nitrate, ammonium sulfate nitrate manufacturing process, properties and use, Suitability of different nitrogenous fertilizers for different soils and crops

Unit – II (9 hrs)
1. Phosphatic fertilizers – classification, manufacturing process, property and use of single super phosphate, triple super phosphate and bone meal
2. Phosphatic fertilizers – basic slag, rock phosphate, dicalcium phosphate manufacture, properties and use. Behavior of phosphatic fertilizers in different soil types and comparative fertilizer value of various phosphatic fertilizers
3. Principles of manufacture of potassic fertilizers, physical and chemical properties in relation to their use in various soils

Unit – III (9 hrs)
2. Unit value and evaluation of fertilizers.
3. Materials supplying secondary nutrients and micro nutrients and chelating compounds.

Unit – IV (9 hrs)
1. Fertilizer control order and specifications of fertilizers Amendments
2. Soil acidity – liming materials and its reaction in acidic soils.

Unit – V (9 hrs)
2. How much fertilizers to use.
3. Diagnostic techniques for soil and crops Soil Analysis Methods
Suggested Readings
11. Fundamentals of Soil Science. Published by Indian Society of Soil Science, IARI New Delhi, 2002
III B.Sc SEMESTER-VI Agriculture
   Elective-II
Paper VII(B) – Manures, Fertilizers and Soil fertility management
   Total hours of teaching 30 hrs @ 2 hrs per week

Practical schedule - Manures, Fertilizers and Soil fertility management

1. Introduction to Analytical Instruments.
2. Principles of pH meter, Conductivity meter, colorimeter and flame photometers
   (AES & AAS)
3. Preparation of soil samples for analysis
4. Determination of pH and electrical conductivity in soil

Practical Model Paper

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<td>4. Record &amp; Viva</td>
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III B.Sc SEMESTER-VI Agriculture
Elective-III
Paper VII(C) - RURAL SOCIOLOGY & EDUCATIONAL PSYCHOLOGY
Total hours of teaching 45 hrs @ 3 hrs per week

Unit – I (9 hrs)
Extension education - Extension – meaning, sociology and rural sociology, scope of rural sociology, Importance of Rural Sociology, Indian rural society, Important characteristics of Indian Rural Society

Unit – II (9 hrs)
Social groups - Characteristics of Social Group, Classification of Group, Culture, Characteristics of Culture, Role of culture in agriculture, Social values and attitudes, Socio-psychological determinants of values

Unit – III (9 hrs)
Social institutions - Definition, social organisations, social organisations, Characteristics, Definition of Family, Characteristics of family, Social Organisations, Essential Characteristics of organisations

Unit – IV (9 hrs)
Educational psychology - Definition of psychology, Educational Psychology, Scope of social psychology Personality, Concept of Personality Perception, Characteristics of perception

Unit – V (9 hrs)

Suggested Readings:
5. Pujari, D. 2002 Educational Psychology in Agriculture, Agrotech Publishing Academy, Udaipur (Raj.) – 31300
III B.Sc SEMESTER-VI Agriculture
Elective-III
Paper VII(C)-Practical Syllabus
RURAL SOCIOLOGY & EDUCATIONAL PSYCHOLOGY
Total hours of teaching 30 hrs @ 2 hrs per week

1. Study and survey about rural and social institutions.
2. Identification of farming needs.
3. Study and Visit to KVK.
4. Selection, Planning and Preparation of visual aids - Charts, Posters.

Practical Model Paper

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<td>Study about social Institutions- report</td>
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<td>Viva and Record</td>
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III B.Sc SEMESTER-VI Agriculture
Cluster Elective-A

Paper VIII A(1) - PRODUCTION ECONOMICS AND FARM MANAGEMENT
Total hours of teaching 45 hrs @ 3 hrs per week

Unit – I

1. Introduction to Farm Management
2. Farm management decision making process: Production, operational, strategic, administrative and marketing management decisions.

Unit – II

1. Basic concepts in farm management. Production, types of resources, choice indicators, costs, revenue, profit, total, average & marginal concepts.

Unit – III

1. Law of diminishing returns – 3 regions of production
2. Cost concepts & interrelations – Optimum level of input use and optimum production

Unit – IV

1. Economies of scale – external and internal economies and diseconomies – Returns to scale – Economies
2. Factor – Factor relationship – Principle of substitution – isoquant, isocline
3. Expansion path, ridgeline and least cost combination of inputs

Unit – V

1. Product – Product relationship – types. Production possibility curve, iso revenue line and optimum combination of outputs
2. Equi-marginal returns and Opportunity cost – comparative advantage
3. Concepts of Risk and uncertainty – types of uncertainty in agriculture – managerial decisions to reduce risks in production process

Suggested Readings
III B.Sc SEMESTER-VI Agriculture
Cluster Elective-A
Paper VIII A(1) - PRODUCTION ECONOMICS AND FARM MANAGEMENT
Total hours of teaching 30 hrs @ 2 hrs per week

Practical schedule

1. Preparation of interview schedule - Estimation of cost of crop and livestock enterprises
3. Preparation of farm plan and budget
4. Analysis of farm records and accounts farm inventory, balance sheet, profit and loss accounts.
5. Computation of depreciation using different methods
6. Visit to a farm and cost and return analysis

Practical Model Paper

1. Preparation of farm plan and budget 20 Marks
2. Project report on farm visit 10 Marks
3. Interview schedule 10 Marks
4. Record & Viva 10 Marks

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Total = 50 Marks
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III B.Sc SEMESTER-VI Agriculture  
Cluster Elective-A  
Paper VIII A(2) - Post-harvest Management and  
value addition of horticultural crops  
Total hours of teaching 45 hrs @ 3 hrs per week

Unit – I (9 hrs)
1. State of Indian fruit and vegetable processing industry- Importance of post harvest management of fruits, vegetables and other horticultural produce, problems & prospects  
2. Fruits and vegetables their chemical composition  
3. Physiology of maturity, ripening and senescence in fruits and vegetables

Unit – II (9 hrs)
1. Post harvest losses - Pre and post harvest factors causing loss and spoilage of fruits and vegetables  
2. Post harvest management techniques for fruits and vegetables- Pre-cooling- methods- grading and sorting- other operations- washing-sanitization- heat treatments- waxing- curing etc.  
3. Storage system- ambient, low temperature, modified and controlled atmosphere storage systems- storage disorders

Unit – III (9 hrs)
2. Government policies, regulations and specifications for fresh and processed products- Marketing systems- Export promotion agencies and their role in export of fresh and processed products.  

Unit – IV (9 hrs)
2. Principles of preservation by application of heat (Thermal processing) -pasteurization – sterilization- Steps in canning and spoilage of canned products.  
3. Principles of preservation by ionizing radiations, Principles of preservation by chemical methods- Role of sugar, brine, acid and other chemical, preservatives, other food additives.
Unit – V  
(9 hrs)

1. Principles of preservation by fermentation- Alcoholic, acetic and lactic fermentation processes.
2. Recent advances in food preservation techniques.
3. Post harvest technology of Tree spices
4. Post harvest technology of essential oil yielding crops
5. Post harvest technology of cut flowers
6. Industrial waste utilization

Suggested Readings

III B.Sc SEMESTER-VI Agriculture
Cluster Elective-A

Paper VIII A(2) - Post-harvest Management and 
value addition of horticultural crops

Total hours of teaching 30 hrs @ 2 hrs per week

Practical schedule
1. Guidelines for establishing fruit and vegetable processing unit- FSSAI standards
2. Preliminary processing of fruits
3. Determination of total soluble solids
4. Preparation of fruit beverages (squash/ syrup/ RTS beverage)
5. Cashew apple processing
6. Preparation of fruit jam
7. Preparation of guava jelly
8. Grape wine preparation
9. Preparation of pickle
10. Tomato processing
11. Visit to processing units of horticultural crops, familiarization with different processed products from spices and plantation crops

Practical Model Paper

1. Preparation of fruit products 20 Marks
2. Project report on farm visit 10 Marks
3. Interview schedule 10 Marks
4. Record & Viva 10 Marks

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Total = 50 Marks
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III B.Sc SEMESTER-VI Agriculture
Cluster Elective-A
Paper VIII A(3) - ANIMAL HUSBANDRY
Total hours of teaching 45 hrs @ 3 hrs per week

Unit – I

1. Introduction - Role of Livestock in Indian Agriculture - Livestock census
2. Definition of Breed – Classification of indigenous and exotic cattle Breed- characteristics of Sindhi, Kangayam, Kankrej, Jersey, Holstein Friesian, Brown Swiss, Murrah and Surti.

Unit – II

1. Physical examination of milk and Determination of Specific gravity
2. Determination of Fat percentage, Total solids, Solid Not Fat
3. Legal standards of milk, Determination of adulterants in milk

Unit – III

1. Common cattle feeds and their classification
2. Care & management of pregnant cow Gestation period in different species
3. Care and management of new born calf, Milk definition, Composition of milk

Unit – IV

1. Factors affecting milk yield and composition, Clean milk production
2. Preservation of milk – Pasteurization and other methods.
3. Nutrition–definition, Ration Balanced ration Requirement and importance of green fodder

Unit – V

1. Swine husbandry – common breeds
2. Poultry Definition, Introduction of systems of poultry rearing, Brooding and rearing of chicks
3. Rearing of growers and layers, Broiler rearing, Common diseases symptoms and Vaccination schedule for poultry.
Suggested Readings
III B.Sc SEMESTER-VI Agriculture
Cluster Elective-A
Paper VIII A(3) - ANIMAL HUSBANDRY

Practical schedule
Total hours of teaching 30 hrs @ 2 hrs per week

1. Body parts of cow
2. Identification of animals
3. Instruments used in Animal Husbandry practices 123
4. Ageing of cattle
5. Housing of Cattle
6. Milking of animals
7. Physical examination of milk and Determination of Specific gravity
8. Legal standards of milk, Determination of adulterants in milk
9. Common cattle feeds and their classification
10. Body parts and Handling of birds
11. Classification of Poultry
12. Visit to poultry farm

Practical Model Paper

1. Identification of cattle feeds 20 Marks
2. Project report on farm visit 10 Marks
3. Identification of instruments 10 Marks
4. Record & Viva 10 Marks

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Total = 50 Marks
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III B.Sc SEMESTER-VI Agriculture
Cluster Elective-B
Paper VIII B(1) - GENETICS AND PLANT BREEDING
Total hours of teaching 45 hrs @ 3 hrs per week

Unit – I (9 hrs)

2. Modes of reproduction – Sexual and asexual, Apomixis - classification & significance
3. Self Incompatibility – types and applications in crop improvement

Unit – II (9 hrs)

1. Male sterility – types and utilization in crop improvement
2. Plant genetic resources – conservation and utilization
3. Centers of origin and diversity, Acclimatisation and domestication

Unit – III (9 hrs)

1. Systems of mating – Random and non random- Genetic basis and methods of breeding suited to SP & CP plants
2. Introduction as a breeding method
3. Components of variability, heritability and genetic advance

Unit – IV (9 hrs)

1. Selection – Mass, Pure line and maternal selections – pure line theory Combination breeding – objectives and types - handling of segregating generations
2. Back cross breeding – advantages and methodology – multiline concept
3. Heterosis breeding – features and theories of Heterosis - estimation of heterosis

Unit – V (9 hrs)

1. Exploitation of hybrid vigour, development of inbred lines and their evaluation – inbreeding depression- Types of hybrids - Single cross, three way and double cross hybrids, synthetics and composites
2. Concepts of population genetics and Hardy Weinberg law
3. Population improvement - different types of recurrent selection schemes
Suggested Readings

III B.Sc SEMESTER-VI Agriculture
Cluster Elective-B
Paper VIII B(1) - GENETICS AND PLANT BREEDING
Total hours of teaching 30 hrs @ 2 hrs per week

Practical schedule
1. Plant Breeder’s kit, Study of germplasm of various crops
2. Floral biology of self pollinated crops like rice, cowpea etc
3. Floral biology of cross pollinated crops like maize, coconut etc
4. Emasculation & Hybridization techniques in various self and cross pollinated crops
5. Study of male sterility system in crops and consequences of inbreeding
6. Field layout of experiments, Data collection

Practical Model Paper

1. Field layout of experiments, Data collection 20 Marks
2. Emasculation 20 Marks
3. Record & Viva 10 Marks

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Total = 50 Marks
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III B.Sc SEMESTER-VI Agriculture
Cluster Elective-B

Paper VIII B(2) - Organic Farming and Sustainable Agriculture
Total hours of teaching 45 hrs @ 3 hrs per week

Unit – I
Concept of organic farming (9 hrs)
1. Introduction: Farming, organic farming, concept and development of organic farming.
2. Principles of organic farming, Types of organic farming, Biodynamic farming
4. Scope of organic farming; Andhra Pradesh, national and international status
5. Agencies and institutions related to organic agriculture
6. Requirements for organic farming, Farm components for an organic farm

Unit – II
Organic plant nutrient management (9 hrs)
1. Organic farming systems, Soil tillage, Land preparation and mulching
2. Choice of varieties
3. Propagation-seed, planting materials and seed treatments, Water management
4. Green manuring, Composting- principles, stages, types and factors, Composting methods, Vermicomposting
5. Bulky organic manures, Concentrated organic manures, Organic preparations, Organic amendments and sludges, biogas
6. Bio-fertilizers- types, methods of application, advantages and disadvantages, Standards for organic inputs- fertilizers

Unit – III
1. Plant protection- cultural, mechanical, botanical pesticides,control agents
2. Weed management
3. Standards for organic inputs- plant protection

Unit – IV
Organic crop production practices (9 hrs)
1. Organic crop production methods- rice, coconut
2. Organic crop production methods- vegetables- okra, amaranthus, cucurbits
3. Livestock component in organic farming

Unit – V
Organic Certification (9 hrs)
1. Farm economy: Basic concept of economics- Demand, supply, Economic Viability of a farm.
2. Basic production principles, Reducing expenses, ways to increase returns, Cost of production system. Benefit/ cost ratio, Marketing, Imports and exports
4. Farm inspection and certification
5. Conversion to organic farming, Process
Suggested Readings

III B.Sc SEMESTER-VI Agriculture
Cluster Elective-B
Paper VIII B(2) - Organic Farming and Sustainable Agriculture
Total hours of teaching 30 hrs @ 2 hrs per week

Practical schedule

1. Study of different organic materials
2. Preparation of enriched Farm Yard Manure
3. Study of composting methods
4. Preparation of vermin-compost
5. Study of recycling of farm waste
6. Study of green manuring
7. Visit to urban waste recycling unit
8. Study of bio fertilizer

Practical Model Paper

1. Visit to urban waste recycling unit 20 Marks
2. Study of different organic materials (Project) 20 Marks
3. Record & Viva 10 Marks

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Total = 50 Marks
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III B.Sc SEMESTER-VI Agriculture  
Cluster Elective-B  
Paper VIII B(3) - SOCIAL AND FARM FORESTRY  
Total hours of teaching 45 hrs @ 3 hrs per week

Unit – I  
(9 hrs)
1. Role of forests – productive role – food, fuel, clothing, shelter, timber and non-timber forest produce and protective role – climate amelioration, soil and water conservation, habitat for wildlife, purification of atmosphere.

Unit – II  
(9 hrs)
1. Classification of agroforestry systems on structural, functional, socio-economic and ecological basis
2. Agrisilvicultural systems – improved fallow species in shifting cultivation, taungya system, multi species tree garden, alley cropping, multi purpose trees and shrubs on farmlands, crop combinations with plantation crops, fuel wood plantations

Unit – III  
(9 hrs)
1. Silvipastural system – protein bank, live fence of fodder and hedges and trees and shrubs on pasture
2. Agrisilvipastural systems – homestead, woody hedgerows for browse, mulch, green manure, soil conservation – other systems
3. Planning in agroforestry – Diagnosis and Design

Unit – IV  
(9 hrs)
1. Agroforestry systems for seven agro climatic zones in Andhra Pradesh
2. Community forestry – evolution of social forestry concepts – Social forestry in Andhra Pradesh, Interface forestry – JFM, TAP

Unit – V  
(9 hrs)
1. Silvicultural practices for Teak, Eucalyptus and Tamarind
2. Silvicultural practices for Ailanthus, Neem, Pungam and Prosopis

Suggested Readings

III B.Sc SEMESTER-VI Agriculture
Cluster Elective-B
Paper VIII B(3) - SOCIAL AND FARM FORESTRY
Total hours of teaching 30 hrs @ 2 hrs per week

Practical schedule

1. Study of Status of Indian forests – Comparison with other countries
2. Planting of Fruit trees in the college campus and road side area near the college.
3. Study of Agrisilvicultural systems (Project)
4. Preparation of charts regarding afforestation

Practical Model Paper

1. Preparation of charts 20 Marks
2. Survey of Trees in the campus 20 Marks
3. Record and Viva 10 Marks

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Total = 50 Marks
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