

**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL
SCIENCE SEHORE (MP)**

B.Sc. (Ag.) DEGREE PROGRAMME

3RD Year

Fifth Semester

Credits

AG-501 -Farming system and sustainable agriculture.	3
AG-502 -Principles of plant biotechnology	3
AG-503 -Crop pest and stored grain pest and their management.	3
AG-504 -Fundamental of Agri. Business Management.	2
AG-505 - Fundamentals of Rural Sociology and Educational Psychology	3
AG-506 - Post harvest Mgt. &value addition of fruits and vegetables	3
AG-507 - Disease of Horticultural Crops and their management	3
AG-508 - Field Crops-I (Kharif)	4
Total	24

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SUBJECT CODE-AG 501

Farming Systems and Sustainable Agriculture 3(2+1)

UNIT-1. Sustainable agriculture: Introduction and definition, Sustainable agriculture: Goal and current concepts, Factor affecting ecological balance,

UNIT-2. Ameliorative measures for ecological balance, Land degradation, Conservators of natural resources,

UNIT-3. LEIA & HELA, Irrigation problems, Wastelands and their development,

UNIT-4. Organic Farming : Definition, principles and components, Farming systems : definition, principles and components,

UNIT-5. Integrated Farming System models for wetland situations, Integrated Farming System models for irrigated dry land situation, Integrated Farming System models for dry land situation,

Practical

1. Preparation of cropping scheme for irrigated situations
2. Preparation of cropping scheme for dryland situations
3. Study of existing farming systems in nearby villages
4. Preparation of integrated farming system models for wetlands
5. Preparation of integrated farming system models for drylands
6. Preparation of enriched Farm Yard Manure
7. Preparation of vermicompost
8. Visit to urban waste recycling unit
9. Study of profitable utilization of agricultural wastes
10. Visit to poultry units to study resource allocation, utilization and economics
11. Visit to dairy units to study resource allocation, utilization and economics

References

1. Cropping and Farming system – S.C. Panda, Agrobios Publication
2. Proceeding of Symposium on – Indian Society of Cropping System, Efficient Cropping System Agronomy, New Delhi
3. Principles and Practices of – S.S. Singh, Kalyani Publication Agronomy
4. Farm Management – S.K. Tondon and S.P. Dondhyal

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SUBJECT CODE-AG 502

Principles of Plant Biotechnology 3(2+1)

UNIT-1. Concepts of Plant Biotechnology: History of Plant Tissue Culture and Plant Genetic Engineering

UNIT-2. Scope and importance in Crop Improvement :(a) Totipotency and Morphogenesis, (b) Nutritional requirements of in-vitro cultures

UNIT-3. Techniques of *In vitro* cultures (a) Micro propagation
(b) Anther culture (c) Pollen culture (d) Ovule culture (e) Embryo culture
(f) Test tube fertilization (g) Endosperm culture
h) Factors affecting above in vitro culture (i) Applications and achievements

UNIT-4. Soma clonal variation, types, reasons, Somatic embryogenesis and synthetic seed production technology, Protoplast isolation
a) Culture, manipulation and fusion (b) products of somatic hybrids and hybrids, applications in crop improvement

UNIT-5. Genetic engineering (a) Restriction enzymes (b) Vectors for gene transfer
(c) Gene cloning (d) Direct and indirect method of gene transfer
(e) Transgenic plants and their applications

Practical

1. Requirements for Plant Tissue Culture Laboratory
2. Techniques in Plant Tissue Culture
3. Media components and preparations
4. Sterilization techniques and inoculation of various explants
5. Aseptic manipulation of various explants
6. Callus induction and Plant Regeneration
7. Micro propagation of important crops
8. Anther, Embryo and Endosperm culture
9. Hardening/Acclimatization of regenerated plants
10. Somatic embryogenesis and synthetic seed production

References

1. Plant Biotechnology – H.S. Chawala
2. Biotechnology – B.D. Singh
3. Element of Biotechnology – Prof. P.K. Gupta
4. Plant Biotechnology – Dr. S.S. Purohit

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCE SEHORE (MP)

SUBJECT CODE-AG 503

Crop Pests and Stored Grain Pests and their Management 3(2+1)

UNIT-1. 1. Study of stored grain pests of order coleopteran their biology and damage pulse beetle, red flour beetle, khapra beetle and rice weevil, Study of stored grain pests of order Lepidoptera their biology and damage – rice moth, Study of preventive and curative methods against stored grain pests, Distribution, biology, nature and symptoms of damage of insect pests of **Rice**, Hipsa, grass hopper, rice leaf roller, brown plant hopper, green leaf hopper, white backed plant hopper rice gundhi bug, **Sorghum and maize**, Sorghum shoot fly, maize stem borer, cob borers-ear head caterpillar, army worm green sting bug

UNIT-2. Ragi, Stem borer, web worm **Wheat**, Termite, **Sugarcane**, Early shoot borer, top shoot borer; Pyrilla, white fly, mealy bug and scale insect **Cotton**, Cotton aphid, white fly, red cotton bug, Jassid and Thrips pink boll worm, spotted boll worm, American boll worm and tobacco caterpillar, leaf roller and mealy bug. Non Pests-Mites, **Mesta and Sunnhmp** – Red hairy caterpillar, capsule borer and Bihar hairy caterpillar, **Pulses** – Tobacco caterpillar, jassid, aphid green stink bug. Green gram, black gram lentil, Rajmas and Lytherie.

UNIT-3. Pigeonpea – Aphid, Thirps, Pod fly and Pod bug, Plume moth **Chickpea** – Cut worm, gram pod borer **Pea** – Pea leaf miner and pea pod borer **Soybean** – Girdle beetle, stem fly and tobacco caterpillar **Groundnut** – White grub and red hairy caterpillar **Castor** – Castor semilooper **Gingerly/Sesame** – Leaf roller and capsule borer, Til hawk moth

UNIT-4. Safflower – Aphid, capsule fly **Mustard** – Aphid, sawfly, flea beetle, painted bug **Sunflower** – Head capsule borer (Helicoverpa) **Brinjal** – Shoot and fruit borer **Bhindi** – Shoot and fruit borer, jassid **Tomato** – Gram pod borer

UNIT-5. Cruciferous – Diamond back moth, tobacco caterpillar **Cucurbitace** – Red pumpkin beetle, fruit fly, spotted leaf beetle, blister beetle **Potato** – Potato tuber moth, Cut worm **Colacasia** – Tobacco caterpillar **Sweet potato** – Sweet potato weevil **Amaranthus** – Leaf caterpillar **Chilli** – Thrips, chilli budfly **Non pest** – Chilli mite **Mango** – Leaf hopper, mealy bug, fruit fly, nut weevil (stone weevil) **Citrus** – Lemon butter fly, citrus cilla, leaf miner, white fly, fruit sucking moth **Banana** – Rizome borer, Psedostem borer, aphid

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Practical

Identification of pests, their damage symptoms and management

1. Rice 9. Malvaceous vegetables
2. Sorghum 10. Cruciferous vegetables
3. Maize 11. Cucurbitaceous vegetables
4. Wheat 12. Chilli
5. Sugarcane 13. Mango
6. Cotton 14. Banana
7. Pulses 15. Citrus
8. Solanaceous vegetables 16. Sapota

References

1. Storage Pest Management – Sharma, S. and Choudhary, A.
2. ikS/k laj{k.k ekxZnf'kZdk – Dhamdhare, Chawan, Kishore and Bartiya
3. Management of Insect Pests of – Gupta, H.C.L. Horticultural Crops
4. Text book of Entomology – Pruthi, H.S.
5. Qyksa ds gkfudkjd dhV – Virendra Kumar Sharma
6. ICth;ksa ds gkfudkjd dhV – Virendra Kumar Sharma
7. Cotton pests and Bio control agents – Sathe, T.V.
8. Economic and Applied Entomology – Ashok Kumar and Prem Mohan Nigam
9. A Test book of Applied Entomology – K.P. Shrivastava (Vol. II)

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCE SEHORE (MP)

SUBJECT CODE-AG 504 Agriculture Business management 2(2+0)

UNIT-1. Agribusiness : Meaning, definition, structure of agribusiness (input, farm product sectors), importance of agribusiness in the Indian economy, Agricultural Policy, Agribusiness Management-Distinctive features, importance of good management, definitions of management, Management functions.

UNIT-2. Planning, meaning, definition, types of plans (Purpose or mission, goals or objectives, strategies, policies procedures, rules, programmes, budget), characteristics of sound plan, steps in planning, Organization staffing, directing, motivation, ordering, leading, supervision, communications, control

UNIT-3. Capital Management, Financial management of Agribusiness: Importance of Financial statements, Balance sheet, Profit and loss statement, Analysis of financial statements, Agro-based industries: Importance and needs, classification of industries, Types of agro based industries. Institutional arrangement, procedure to setup agro based industries. Constraints in establishing agro-based industries

UNIT-4. Marketing Management: Meaning, definitions, marketing mix, 4Ps of Marketing, Mix, market segmentation, Methods of market, Product life cycle, Pricing policy, meaning, pricing method. Prices at various stages of marketing

UNIT-5. Project : Definitions, project cycle, identification, formulation, appraisal, implementation, monitoring and evaluation, Appraisal and evaluation techniques, NPW, BCR, IRR, N/K ratio, Sensitivity analysis, Characteristics of agricultural projects : Preparation of project reports for various activities in agriculture and allied sectors: Dairying, poultry, fisheries, agro-industries etc.

References

1. Agribusiness Management – W. David Downey and Steven P. Erickson
2. Introduction of Agril. Business – Davis, J. and Gold Berg Management
3. Project Management and Control – Rao
4. Project Management – S. Choudhary, Hill Publication Company, New Delhi
5. Project Management – Nagaraja
6. Agri. Business Management – Broadway, Himalaya Publication House, New Delhi
7. Project Planning, Analysis, Selection, – Chandra Implementation and Review

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCE SEHORE (MP)

SUBJECT CODE-AG 505

Fundamentals of Rural Sociology and Educational Psychology 3(3+0)

UNIT-1.Introductory lecture, Meaning and definition of extension education and agriculture extension, Scope and importance of sociology in agriculture extension and interrelationship between rural sociology and agriculture extension, Meaning of rural sociology and its important characteristics.

UNIT-2.Difference and relationship between rural and urban societies, Meaning and Definition of social group and its classification, Factors considered in formation and organization of a group, Motivation in group formation and role of social group in agricultural extension.

UNIT-3.Meaning and definition of social values and attitudes, Types and role of social values and attitudes in agriculture extension, Meaning and definition of social institution and major institutions in rural society, Function and role of major institutions in agriculture extension.

UNIT-4. Meaning and definition of social control, Need and means of social control, Meaning, definition and nature of social change, Dimension and factors responsible for social change, Meaning, definition and classification of leadership, Roles of leader in agriculture extension, Different methods of selection of professional and lay leaders, advantages and limitations in use of local leaders in agriculture extension.

UNIT-5. Meaning and definition of psychology and educational psychology, Scope and importance of educational psychology in agriculture extension, Meaning and definition of intelligence and its types, Factors affecting intelligence and its importance in agriculture extension, Meaning and definition of teaching and learning process, Learning experience and learning situation

References

1. Introductory Rural Sociology – Chitambar, J.B., Wiley Eastern Private Limited, New Delhi
2. Education and communication – Dahama O.P. and Bhatnagar, O.P., for development Oxford and IBH Publishing Co. New Delhi
3. Rural Sociology in India – Desai, A.R., Popular Prakashan, Bombay
4. Educational Psychology – Jitendra Mohan, Wiley Eastern Limited, New Delhi

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCE SEHORE (MP)

SUBJECT CODE-AG 506

Post Harvest Management and Value Addition of Fruits and Vegetables 3(2+1)

UNIT-1. Importance of post harvest technology in horticultural crops, Maturity indices, harvesting, post harvest handling of fruits and vegetables, Maturity and ripening process, factors affecting ripening in fruits and vegetables.

UNIT-2. pre harvest factors affecting quality on post harvest shelf life of fruits and Vegetables, Chemicals used for hastening, delaying in ripening of fruits and vegetables, Methods of storage – precooling, pre storage treatments, low temperature storage controlled atmospheric storage.

UNIT-3. Various methods of packing, packaging materials and transport, packing techniques for export, Fabrication of types of containers, cushioning materials, vacuum packing, poly shrink packing, specific packing for export of mango, banana, grapes, kinnow, mandarin and sweet orange

UNIT-4. Importance and scope of fruits and vegetable preservation, Principles of preservation by heat, low temperature, chemicals and fermentation
Unit layout-selection of site, precautions for hygienic conditions of unit

UNIT-5. Preservation through, canning, bottling, freezing, drying, dehydration, ultraviolet and ionizing radiations, Preparation of jams, jellies, marmalades, candies, crystallized, glazed fruits, preserves, chutney, pickle, ketchup, sauce, puree, syrups, juices, squashes and cordials

Practical

1. Practice in judging the maturity of fruits and vegetables
2. Conservation of zero energy cool chambers for on farm storage
3. Determination of physiological loss in weight, total soluble solids, total sugars, acidity, ascorbic acids contents in fruits and vegetables
4. Types, methods of packing and importance of ventilation, pre-cooling packing methods for export
5. Methods of prolonging storage life
6. Effect of ethylene on ripening of Banana, Sapota, Mango
7. Identification of equipment and machinery used in preservation of fruits and vegetables

References

1. Principles and Practices of Post Harvest Technology – P.H. Panday
2. Post Harvest Technology of Fruits and Vegetables – L.R. Verma and V.K. Joshi
3. Post Harvest Technology of Horticultural Crops – K.P. Sudheer
4. Post Harvest Management of Horticultural Crops – M.A. Mir
5. Marketing of Processed, Fruits and Vegetables – M. Choudhory

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCE SEHORE (MP)

SUBJECT CODE-AG 507

Diseases of Horticultural Crops and their Management 3(2+1)

UNIT-1. Study of following diseases with reference to their economic importance, symptoms, causal organism, etiology, epidemiology, diseases cycle and integrated management, Rust diseases of Rose, Beans, Coffee, Tea, Mulberry, Jasmine, White rust of crucifers, Leaf blight of Mango (twig die back), Brinjal (phomopsis), Potato (early and late), Tomato (early)

UNIT-2. Bacterial blight of Betelvine, Mulberry, Mango, Bacterial leaf spot of pomegranate, Leaf spot of Banana (sigatoka diseases), Sapota (*Phaeophleospora indica*), Grapevine (*Cercospora viticola*), Crucifers (*Alternaria brassicicola*), Mulberry (*Cercospora moricola*), Jasmine (*Alternaria jasmini*)

UNIT-3. Powdery mildew of Mango, Grapevine, Apple, Cucurbits, Rose, Mulberry, Crysanthimum, Downy mildew of Grapevine, Crucifers, Cucurbits, Onion, Anthracnose of Papaya, Mango, Citrus, Grapevine, Guava, Chilli, Cucurbits, Beans, Bacterial wilt of Banana, Guava, Brinjal

UNIT-4. Fungal wilt of Bhindi, Crysanthimum, Banana (panama disease), Damping off of Papaya, Tomato, Collar rot of Papaya, Apple, Brinjal, Chrysanthemum (Stem rot), Root rot of Apple, Crysanthimum, Onion smut, Citrus canker, Stem canker of Mango, Bud rot of Coconut, Oil palm, stem bleeding of coconut, Mango malformation and black tip

UNIT-5. Citrus gummosis and greening, Black rot of Crucifers, Little leaf of brinjal, Leaf curl of Chilli, Potato, Tomato, Mosaic of Papaya, Beans, Bunchy top of banana, Little leaf of brinjal, Black mold of onion, Sooty mold of sapota,

Practical

Diseases of beans, citrus, guava and sapota; Diseases of papaya, banana, pomegranate and ber; Diseases of mango, grapes and apple; Diseases of chilli, brinjal and bhindi; Diseases of potato, tomato and crucifers; Diseases of cucurbits, onion and betelvine; Diseases of oil palm, coconut, tea, coffee and mulberry, Diseases of rose, chrysanthemum and jasmine. Field visit at appropriate time during the semester.

References

1. Diseases of Vegetable crops - R.S. Singh
2. Diseases of Plantation crops – Kulkarni and their management
3. Diseases of Fruits and Plantation - Jahagirdar, Shamora crops and their management, A modern perspective
- 4 Diseases of Plantation Crops - V.K. Gupta
5. Diseases of Vegetable Crops - J.C. Walker
6. Diseases of Fruit Crops - V.K. Gupta

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCE SEHORE (MP)

SUBJECT CODE-AG 508

Field Crops- I (Kharif) 4(3+1)

UNIT-1. Cereals – rice, maize, sorghum, pearl millets and minor millets (*kodo, kutki, ragi, sawan, cheena and kangni*), Pulses – pigeon pea, mung bean and urd bean Oilseeds – groundnut sesamum and soybean, Fibre crops – cotton, Forage crops – sorghum, maize, cowpea, cluster bean and napier grass Different kharif crops mentioned above will be taught under the following heads.

UNIT-2. Origin, history, distribution and economic importance, Soil and climatic requirement, Agronomic characteristics of the important varieties suitable for the various farming situations of the state, Land preparation and sowing management : selection of seeds, seed rate, plant population, planting geometry, seed treatment and seed inoculation, sowing depth, suitable sowing methods, gap filling and thinning, watching of sown seeds and germinating seedlings

UNIT-3. Application of manures and fertilizers : time and method of application, Interculture and weeding : earthing, hoeing, control of weeds by agronomical and chemical means, critical period of weed control Irrigation : methods of irrigation and critical growth stages of crops for irrigation.

UNIT-4. Plant protection measures : insect pests and diseases causing damage to the crops and remedial measures to control them Judging of maturity stage of crop and method of harvesting

UNIT-5. Efficient and suitable method of winnowing, cleaning, grading and measurement of yield, Proper storage of produce at suitable moisture content in grains, protection against insect pest and moisture, Suitable crop rotation and crop mixtures

Practical

1. Identification of different Kharif crops and their associated weeds
2. Nursery bed preparation for rice and transplanting/seed bed preparation and sowing of Kharif crops
3. Calculation of seed rate, plant population, fertilizer requirement and herbicide requirement for the crop
4. Sowing of soybean, pigeonpea, mung bean, maize, ground nut and cotton
5. Study the effect of sowing depth and seed size on germination of soybean
6. Top dressing of nitrogen in rice and maize

References

1. Scientific crop production (1&2) – C. Thakur
2. Hand Book of Agriculture (IV edition 2006) – ICAR Publication
3. Field Crops – Y.M. Iyyer
4. High Yielding Varieties of Crops – Mahabal Ram
5. Principal of Cereal Crop Production - Mahendra Pall, Deka and R.K. Rai
6. Cereal Crop – W.H. Leonard and J.H. Martin

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