SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

B.Sc. (Ag.) (2nd) Year

4th Semester **w.e.f-2016-2017**

Subject Code	Subject Name		Credits
AG- 401	Crop Production Technology –II *(Rabi Crops)*		2(1+1)
AG -402	Production Technology for Ornamental Crops, MAP and Landscaping		2(1+1)
AG -403	Renewable Energy and Green Technology		2(1+1)
AG-404	Problematics Soil & Their Management		2(2+0)
AG -405	Production Technology for Fruit and Plantation Crops		2(1+1)
AG -406	Principles of Seed Technology		3(1+2)
AG -407	Farming System & Sustainable Agriculture		1(1+0)
AG -408	Statistics Methods		2(1+1)
AG -409	Agricultural Marketing Trade & Prices		3(2+1)
AG-410(A)	Elective Course	Protected Cultivation	3(2+1)
AG-410(B)		Bio pesticide and Bio fertilizers	
AG-410(C)		Agrochemicals	
Total			**22**

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SUBJECT CODE-AG 401 **Credit 2(1+1)**

W.e.f.-2016-2017

Crop Production Technology-II (Rabi crops)

UNIT-1. Origin, geographical distribution, economic importance, soil and climatic requirements,

UNIT-2. Varieties, cultural practices and yield of *Rabi* crops; cereals –wheat and barley, pulses-Chickpea, lentil, peas,

UNIT-3. Oilseeds-rapeseed, mustard and sunflower;

UNIT-4. Sugar crops-sugarcane; other crops-potato,

UNIT-5. Forage crops-berseem, lucerne and oat.

Practical

1. Sowing methods of wheat and sugarcane.
2. Identification of weeds in rabi season crops.
3. Study of morphological characteristics of rabi crops.
4. Study of yield contributing characters of rabi season crops.
5. Yield and juice quality analysis of sugarcane.
6. Study of important agronomic experiments of *rabi* crops at experimental farms.
7. Study of *rabi* forage experiments, oil extraction of medicinal crops.
8. Visit to research stations of related crops.

References

1. Rabi Crop Production technology (Hindi)- R.L. Arya.
2. Crop Production at a Glance- Sha Akhilesh
3. Production technology of Rabi Crops – Suresh Singh Tomar, Yagya dev Mishra & Shailendra Singh

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SUBJECT CODE-AG 402 **Credit 2(1+1)**

W.e.f.-2016-2017

Production Technology for Ornamental Crops, MAPs and Landscaping

UNIT-1. Importance and scope of ornamental crops, medicinal and aromatic plants and landscaping.

UNIT-2. Principles of landscaping. Landscape uses of trees, shrubs and climbers.

UNIT-3. Production technology of important cut flowers like rose, gerbera, carnation, and orchids under protected conditions and gladiolus, tuberose, chrysanthemum under open conditions.

UNIT-4. Package of practices for loose flowers like marigold and jasmine under open conditions. Production technology of important medicinal plants like asparagus, aloe, costus, Cinnamomum, periwinkle, isabgol and aromatic plants like mint, lemongrass, citronella, , ocimum, rose, geranium,vetiver.

UNIT-5. Processing and value addition in ornamental crops and MAPs produce.

Practical

1.Identification of Ornamental plants.
2.Identification of Medicinal and Aromatic Plants.
3.Nursery bed preparation and seed sowing.
4.Training and pruning of Ornamental plants.
5.Planning and layout of garden.
6.Bed preparation and planting of MAP.
7.Protected structures – care and maintenance.
8.Intercultural operations in flowers and MAP.
9.Harvesting and post harvest handling of cut and loose flowers.
10.Processing of MAP. Visit to commercial flower/MAP unit.

References

1 Textbook of Production Technology for Ornamental Crops MAPs and Landscaping- Lal
2. Principal of Landscaping Gardening- Dr Hemla Nail & S.Y. Chandrashekhar & Laxmi

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SUBJECT CODE-AG 403 **Credit 2(1+1)**

W.e.f.-2016-2017

Renewable Energy and Green Technology

UNIT-1. Classification of with biomass utilization for biofuel production and their application, Familiarization with types of biogas plants and gasifies,

UNIT-2. Biogas, bio alcohol, biodiesel and biooil production and their energy sources, contribution of these of sources in agricultural sector, Familiarization utilization as bioenergy resource,

UNIT-3. Introduction of solar energy, collection and their application, Familiarization with solar energy gadgets: solar cooker, solar water heater,

UNIT-4. Application of solar energy: solar drying, solar pond, solar distillation, solar photovoltaic system and their application,

UNIT-5. Introduction of wind energy and their application.

Practical

1.Familiarization with renewable energy gadgets.
2.To study biogas plants.
3.To study gasifier, To study the production process of biodiesel,
4.To study briquetting machine,
5.To study the production process of bio-fuels. Familiarization with different solar energy gadgets.
6.To study solar photovoltaic system: solar light, solar pumping, solar fencing.
7.To study solar cooker, To study solar drying system.
8.To study solar distillation and solar pond.

References

1. Renewable Energy – Er. Kumar Sanjay.
2. Renewable Energy Sources and Methods- Anne Maczulak
3. Textbook of Renewable Energy & Green Technology-S.K & Laxmi lal Danhich.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SUBJECT CODE-AG 404 **Credit 2(2+0)**

Problematic soil & their management **w.e.f.-2016-2017**

1. Soil quality and health, Distribution of Waste land and problem soils in India. Their categorization based on properties.

2. Reclamation and management of Saline and sodic soils, Acid soils, Acid Sulphate soils, Eroded and Compacted soils, Flooded soils, Polluted soils.

3. Irrigation water – quality and standards, utilization of saline water in agriculture.

4. Remote sensing and GIS in diagnosis and management of problem soils.

5. Multipurpose tree species, bio remediation through MPTs of soils, land capability and classification, land suitability classification. Problematic soils under different Agro-ecosystems

References

1. The Nature and Properties of Soil – Brady, N.C. & Weil, R.R., Macmill
2. Fundamentals of Soil Science – ICAR Publication, New Delhi
3. Text Book of Soil Physics – A.K. Saha, Kalyani Publication, New Delhi
4. Introductory of Soil Science – Dr. Dilip kumar das
5. Soil Science Fertilizers and Manures – Dr vinay singh.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SUBJECT CODE-AG 405 **Credit 2(1+1)**

W.e.f.-2016-2017

Production Technology for Fruit and Plantation Crops

UNIT-1. Importance and scope of fruit and plantation crop industry in India;

UNIT-2. High density planting; Use of rootstocks;

UNIT-3. Production technologies for the cultivation of major fruits-mango, banana, citrus, grape, guava, litchi, papaya, apple,

UNIT-4. Pear, peach and; minor fruits- pineapple, pomegranate, jackfruit, strawberry, nut crops;

UNIT-5. Plantation crops-coconut, arecanut, cashew, tea, coffee & rubber.

Practical

1. Seed propagation. Scarification and stratification of seeds.
2. Propagation methods for fruit and plantation crops including Micro-propagation.
3. Description and identification of fruit.
4. Preparation of plant bio regulators and their uses, Pests, diseases and physiological disorders of above fruit and plantation crops,
5. Visit to commercial orchard.

References

1. Production technology of Fruit and Plantation Crops - G.S Sani.
2. Production technology of Fruit and Plantation Crops-M. Kavina, V. Jegadeeswari, R.M. Vijay Kumar & S.Balakrishnan
3. Production Technology of Fruit Crops- P.Singh

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SUBJECT CODE-AG 406 **Credit 3(1+2)**

W.e.f.-2016-2017

Principles of Seed Technology

UNIT-1. Seed and seed technology: introduction, definition and importance. Deterioration causes of crop varieties and their control; Maintenance of genetic purity during seed production, seed quality; Definition, Characters of good quality seed, different classes of seed.

UNIT-2. Foundation and certified seed production of important cereals, pulses, oilseeds, fodder and vegetables. Seed certification, phases of certification, procedure for seed certification, field inspection. Seed Act and Seed Act enforcement.

UNIT-3. Duty and powers of seed inspector, offences and penalties. Seeds Control Order 1983, Varietal Identification through Grow Out Test and Electrophoresis,Molecular and Biochemical test.

UNIT-4. Detection of genetically modified crops, Transgene contamination in non-GM crops, GM crops and organic seed production.Seed drying, processing and their steps, seed testing for quality assessment, seed treatment, its importance, method of application and seed packing. Seed storage; general principles, stages and factors affecting seed longevity during storage. Measures for pest and disease control during storage.

UNIT-5. Seed marketing: structure and organization, sales generation activities, promotional media. Factors affecting seed marketing, Role of WTO and OECD in seed marketing.

Practical

1. Seed production in major cereals: Wheat, Rice, Maize, Sorghum and Bajra.
2. Seed production in major pulses: Urd, Mung, Pigeonpea, Lentil, Gram, Fieldpea.
3. Seed production in major oilseeds: Soybean, Rapeseed and Mustard.
4. Seed production in vegetable crops.
5. Seed sampling and testing:
6. Physical purity, germination, viability, etc. Seed and seedling vigour test.
7. Genetic purity test: Grow out test and electrophoresis.
8. Seed certification: Procedure, Field inspection,
9. Preparation of field inspection report.
10. Visit to seed production farms, seed testing laboratories and seed processing plant.

References

1. Principles of Seed technology – P.K. Upadhyay.
2. Seed Technology (Hindi)-Mukesh Kumar
3. Principles of Seed Technology- Tomar

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SUBJECT CODE-AG 407 **Credit 1(1+0)**

W.e.f.-2016-2017

Farming System and Sustainable Agriculture

UNIT-1. Farming System-scope, importance, and concept, Types and systems of farming system and factors affecting types of farming, Farming system components and their maintenance,

UNIT-2. Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation, Allied enterprises and their importance, Tools for determining production and efficiencies in cropping and farming system;

UNIT-3. Sustainable agriculture-problems and its impact on agriculture, indicators of sustainability, adaptation and mitigation,

UNIT-4.conservation agriculture strategies in agriculture, HEIA, and LEISA and its techniques for sustainability,

UNIT-5. Integrated farming system-historical background, objectives and characteristics, components of IFS and its advantages, Site specific development of IFS model for different agro-climatic zones, , Visit of IFS model in different agro-climatic zones of nearby states University/ institutes and farmers field.

References

1. Farming System and Sustainable Agriculture - S.R. Reddy
2. A Text Book of Farming System and Sustainable Agriculture-Aniket Kalhapure, Madhukar dhonde & Balasaheb Shete.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SUBJECT CODE-AG 408 **Credit 2(1+1)**

W.e.f.-2016-2017

Statistical Methods

UNIT-1. Introduction to Statistics and its Applications in Agriculture, Graphical Representation of Data, Measures of Central Tendency & Dispersion, Definition of Probability, Addition and Multiplication Theorem (without proof).

UNIT-2. Simple Problems Based on Probability. Binomial & Poisson Distributions, Definition of Correlation, Scatter Diagram. Karl Pearson's Coefficient of Correlation. Linear Regression Equations.

UNIT-3. Introduction to Test of Significance, One sample & two sample test t for Means, Chi-Square Test of Independence of Attributes in 2 ×2 Contingency Table.

UNIT-4. Introduction to Analysis of Variance, Analysis of One Way Classification.

UNIT-5. Introduction to Sampling Methods, Sampling versus Complete Enumeration, Simple Random Sampling with and without replacement, Use of Random Number Tables for selection of Simple Random Sample.

Practical

1.Graphical Representation of Data. Measures of Central Tendency (Ungrouped data) with Calculation of Quartiles, Deciles & Percentiles.
2.Measures of Central Tendency (Grouped data) with Calculation of Quartiles, Deciles & Percentiles.
3.Measures of Dispersion (Ungrouped Data). Measures of Dispersion (Grouped Data). Moments,
4.Measures of Skewness & Kurtosis (Ungrouped Data). Moments, Measures of Skewness & Kurtosis (Grouped Data). Correlation & Regression Analysis.
5.Application of One Sample t-test. Application of Two Sample Fisher's t-test. Chi-Square test of Goodness of Fit. Chi-Square test of Independence of Attributes for 2 ×2 contingency table.
6.Analysis of Variance One Way Classification.
7.Analysis of Variance Two Way Classification. Selection of random sample using Simple Random Sampling.

References

1. Fundamentals of Mathematical Statistics – S.C. Gupta and V.K. Kapoor
2. Basic Statistics – B.L. Agrawal
3. Design and Analysis of Experiments for – B.L. Mishra Agriculture workers
4. Theory of Sample Surveys and Statistical – K.S. Kushwaha and Decisions Rajesh Kumar

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SUBJECT CODE-AG 409 **Credit 3(2+1)**

W.e.f.-2016-2017

Agricultural Marketing, Trade and Prices

UNIT-1. Agricultural Marketing: Concepts and definitions of market, marketing, agricultural marketing, market structure, marketing mix and market segmentation, classification and characteristics of agricultural markets**;** demand, supply and producer's surplus of agri-commodities: nature and determinants of demand and supply of farm products, producer's surplus – meaning and its types, marketable and marketed surplus, factors affecting marketable surplus of agri-commodities; product life cycle (PLC) and competitive strategies: Meaning and stages in PLC; characteristics of PLC;

UNIT-2. Market promotion – advertising, personal selling, sales promotion and publicity – their meaning and merits & demerits; marketing process and functions: Marketing process-concentration, dispersion and equalization; exchange functions – buying and selling; physical functions – storage, transport and processing; facilitating functions – packaging, branding, grading, quality control and labeling (Agmark);Market functionaries and marketing channels:

UNIT-3. Types and importance of agencies involved in agricultural marketing; meaning and definition of marketing channel; number of channel levels; marketing channels for different farm products;, costs and price spread: Meaning, definition and types of market integration; marketing efficiency; marketing costs, margins and price spread; factors affecting cost of marketing; reasons for higher marketing costs of farm commodities; ways of reducing marketing costs;

UNIT-4. Role of Govt. in agricultural marketing: Public sector institutions- CWC, SWC, FCI & DMI – their objectives and functions; cooperative marketing in India; Risk in marketing: Types of risk in marketing; Agricultural prices and policy: Meaning and functions of price; administered prices; need for agricultural price policy; Trade: Concept of International Trade and its need, theories of absolute and comparative advantage.

UNIT-5. Present status and prospects of international trade in agri-commodities; GATT and WTO; Agreement on Agriculture (AoA) and its implications on Indian agriculture; IPR.

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Practical

1. Plotting and study of demand and supply curves and calculation of elasticities**.**
2. Study of relationship between market arrivals and prices of some selected commodities; Computation of marketable and marketed surplus of important commodities;
3. Study of price behaviour over time for some selected commodities.
4. Construction of index numbers.
5. Visit to a local market to study various marketing functions performed by different agencies,
6. Identification of marketing channels for selected commodity,
7. Collection of data regarding marketing costs, margins and price spread and presentation of report in the class;
8. Visit to market institutions – NAFED, SWC, CWC, cooperative marketing society, etc. to study their organization and functioning.

References

1. Agricultural Marketing in India – S.S. Acharya and N.L. Agrawal, Oxford and IBH Publication Co. Pvt. Ltd., New Delhi
2. An introduction to Marketing – Amarchand, D. and B. Vardhrajan,Vikash Publication House Pvt. Ltd., New Delhi
3. Export Marketing – Balagopal
4. Agricultural Marketing and – L.K. Wader and C. Murty, ICAR.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

Elective Course

SUBJECT CODE-AG 410(A) **Credit 3(2+1)**
W.e.f.-2016-2017

Protected Cultivation

UNIT-1. Protected cultivation-importance and scope, status of protected cultivation in India and world

UNIT-2. Types of protected structure based on site and climate. Cladding material involved in greenhouse/poly house.

UNIT-3. Green house design, environment control, artificial lights, automation. Soil preparation and management, substrate management. Types of benches and containers. Irrigation and fertigation management.

UNIT-4. Propogation and production of quality planting material of horticulture crops. Green house cultivation of important horticulture crops- rose, carnation, crysenthemum,gerbera, orchid, antherium, lilum, tulip, tomato, bell pepper, cucumber, strawberry, pot plants etc.

UNIT-5. Cultivation of economically important medicinal and aromatics plants. off season production of flowers and vegetables. Insects and pest and disease management.

Practical.

1. Raising of seedling and sapling under protected conditions,
2. Use of protrayes in quality planting material production,
3. Bed preparation and planting of crops for production interculture operation.
4. Soil EC and PH measurement regulation of irrigation and fertilizers through drip, fogging and Misting.

References

1. Green house management for – S. Prasad/U. Kumar, Agrobio (India) Horticultural Crops
2. Unit operations of Agricultural – K.M. Sahay and K.K. Singh, Vikas Processing Publishing House, Pvt. Ltd.
3. Post Harvest Technology of Cereals, Pulses and Oilseeds – Dr. A. Chakraverty, Oxford & IBH Publishing Co. Pvt. Ltd.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

Elective Course

SUBJECT CODE-AG 410(B) **Credit 3(2+1)**

W.e.f.-2016-2017

Biopesticide and Biofertilizers

UNIT-1. History and concept of biopesticide, Importance, scope and potential of biopesticide , Definition, concept and classification of biopesticide viz, pathogen, botanical-pesticide, and biorationales, Botanicals and their uses, Mass production technology of bio-pesticide. Virulence, pathogenicity and symptoms of entomopathogenic pathogens and nematodes,

UNIT-2. Methods of application of biopesticides. Methods of quality control and Techniques of use of biopesticides. Impediments and limitation of in production and use of biopesticides.

UNIT-3. Biofertilizers - Introduction, status and scope. Structure and characteristic features of bacterial biofertilizers- *Azospirillum, Azotobacter, Bacillus, Pseudomonas, Rhizobium* and *Frankia*;

UNIT-4. Cynobacterial biofertilizers- *Anabaena, Nostoc,* Hapalosiphon and fungal biofertilizers- AM mycorrhiza and ectomycorhiza. Nitrogen fixation -Free living and symbiotic nitrogen fxation

UNIT-5. Mechanism of phosphate solubilization and phosphate mobilization, K solubilization. Productiontechnology: Strain selection, sterilization, growth and fermentation, mass production of carrierbased and liquid biofertiizers. FCO specifications and quality control of biofertilizers. Application technology for seeds, seedlings, tubers, sets etc. Biofertilizers -Storage, shelf life, quality control and marketing. Factors influencing the efficacy of biofertilizers.

Practical.

1. Isolation and purification of important biopesticides: *Trichoderma Pseudomonas, Bacillus, Metarhyzium* etc. and its production.
2. Identification of important botanicals. Visit to biopesticide laboratory in nearby area.
3. Field visit to explore naturally infected cadavers. Identification of entomopathogenic entities in field condition.
4. Quality control of biopesticides. . Isolation and purification of *Azospirillum , Azotobacter, Rhizobium*, P-solubilizers and cyanobacteria.
5. Mass multiplication and inoculums production of biofertilizers. Isolation of AM fungi -Wet sieving method and sucrose gradient method. Mass production of AM inoculants.

References

1. Biopesticide and Biofertilizers- H.C. Lakshman
2. Biofertilizers Technology- Singh and Purohit
3. Biofertilizers Technology- S.Kannaiyah

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

Elective Course

SUBJECT CODE-AG 410(C) **Credit 3(2+1)**

Agrochemicals **w.e.f.-2016-2017**

UNIT-1. An introduction to agrochemicals, their type and role in agriculture, effect on environment, soil, human and animal health, merits and demerits of their uses in agriculture, management of agrochemicals for sustainable agriculture.

UNIT-2. Herbicides-Major classes, properties and important herbicides. Fate of herbicides. Fungicides - Classification – Inorganic fungicides - characteristics, preparation and use of sulfur and copper, Mode of action-Bordeaux mixture and copper oxychloride. Organic fngicides-Mode of action- Dithiocarbamates-characteristics, preparation and use of Zineb and maneb.

UNIT-3. Systemic fungicides- Benomyl, carboxin, oxycarboxin, Metalaxyl, Carbendazim, characteristics and use. Introduction and classification of insecticides: inorganic and organic insecticides Organochlorine, Organophosphates, Carbamates, Synthetic pyrethroids Neonicotinoids, Biorationals, Insecticide Act and rules, Insecticides banned, withdrawn and restricted use, Fate of insecticides in soil & plant. IGRs Biopesticides, Reduced risk insecticides, Botanicals, plant and animal systemic insecticides their characteristics and uses.

UNIT-4. Fertilizers and their importance. Nitrogenous fertilizers: Feedstocks and Manufacturing of ammonium sulphate, ammonium nitrate, ammonium chloride, urea. Slow release N-fertilizers. Phosphatic fertilizers: feedstock and manufacturing of single superphosphate. Preparation of bone meal and basic slag. Potassic fertilizers: Natural sources of potash, manufacturing of potassiumchloride, potassium sulphate and potassium nitrate.

UNIT-5. Mixed and complex fertilizers: Sources and compatibility–preparation of major, secondary and micronutrient mixtures. Complex fertilizers: Manufacturing of ammonium phosphates,
nitrophosphates and NPK complexes. Fertilizer control order. Fertilizer logistics and marketing. Plant bio-pesticides for ecological agriculture, Bio-insect repellent.

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Practical.

1. Sampling of fertilizers and pesticides. Pesticides application technology to study about Various pesticides appliances. Quick tests for identification of common fertilizers. identification of anionand cation in fertilizer.
2. Calculation of doses of insecticides to be used. To study and identify various formulations of insecticide available kin market.
3. Estimation of nitrogen in Urea. Estimation of water soluble P2O5 and citrate soluble P2O5 in single super phosphate. Estimation of potassium in Muraite of Potash/ Sulphate of Potash by flame photometer.
4. Determination of copper content in copper oxychloride. Determination of sulphur content in sulphur fungicide. Determination of thiram. Determination of ziram content.

References

1. Handbook of Pesticides and Agricultural Chemicals- Richard P Pohanish
2. Agrochemicals Preparation and Mode of action – R.J. Cremlyn