

POST DIPLOMA IN COMMERCIAL HORTICULTURE

SYLLABUS

(with effect from June 2015)



FACULTY OF AGRICULTURE AND ANIMAL HUSBANDRY
The Gandhigram Rural Institute – Deemed University
Gandhigram – 624 302 Tamil Nadu

**FACULTY OF AGRICULTURE AND ANIMAL HUSBANDRY
GANDHIGRAM RURAL INSTITUTE – DEEMED UNIVERSITY - GANDHIGRAM**

**POST DIPLOMA IN COMMERCIAL HORTICULTURE
Scheme of Examinations 2015**

Code No.	Subject	Credit			Total Marks
		T	P	Total	
I Semester					
15HORU0101	Principles of Horticulture	3		3	100
15HORU0102	Principles of Horticulture – practical		1	1	50
15HORU0103	Nursery Management for Horticultural Crops	3		3	100
15HORU0104	Nursery Management for Horticultural Crops – practical		1	1	50
15HORU0105	Fruit Production	3		3	100
15HORU0106	Fruit Production – practical		1	1	50
15HORU0107	Vegetable Production	3		3	100
15HORU0108	Vegetable Production - practical		1	1	50
15HORU0109	Commercial Flower Cultivation	3		3	100
15HORU0110	Commercial Flower Cultivation - practical		1	1	50
15AEXU0101	Communication for Management	3	0	3	100
		18	5	23	850
15EXNU01V1	Village Placement Programme*	-	2	2	100
II Semester					
15HORU0211	Spices, Condiments and Plantation Crops	3		3	100
15HORU0212	Spices, Condiments and Plantation Crops – practical		1	1	50
15HORU0213	Indoor and Outdoor Gardening	3		3	100
15HORU0214	Indoor and Outdoor Gardening - practical		1	1	50
15APPU0215	Pest and Disease Management of Horticultural Crops	3		3	100

15APPU0216	Pest and Disease Management of Horticultural Crops – practical		1	1	50
15HORU0217	Fruit Preservation		2	2	50
15ACSU0201	Computer Fundamentals and Office Automation	3	1	4	150
15AGRU02EX	Electives *	3	1	4	150
		15	7	22	850
* Electives					
15AGRU02E1	Bio-manure and Bio-control Agents	3	1	4	150
15HORU01E2	Commercial Cultivation of Medicinal and Aromatic plants	3	1	4	150

Note:* V.P.P. marks will not be considered for the calculation of GPA & CGPA.

ABSTRACT

	Credit	Marks
I Semester	18 + 5 = 23	850
II Semester	15 + 7 = 22	850

Grand Total	33+12= 45	1700

I SEMESTER
15HORU0101- PRINCIPLES OF HORTICULTURE (3+1)

Objectives:

- 1) To learn about importance, climatic zones, nutritive, aesthetic and industrial value of horticultural crops.
 - 2) To learn about planning and layout of orchard, special horticulture techniques for horticultural crops
- I. **Introduction:** Definition – Scope and importance of horticultural crops – Nutritive, aesthetic and industrial value of horticultural crops – Climatic zones .
- II. **Abiotic factors limiting the fruit production:** Climate as a limiting factor – Effect of temperature, light, humidity and rainfall - Soil as a limiting factor – Effect of soil characters on fruit production – Nutrient supply as a limiting factor – Role of major and minor nutrients. Deficiencies of some essential elements and control measures.
- III. **Layout and site selection:** Selection of site – Preparation methods – Layout of orchards – Planting season – Planting methods
- IV. **Orchard management:** Orchard soil management – Irrigation methods – Training and pruning techniques – Causes for unfruitfulness – Role of growth regulators.
- V. **Harvesting and post harvest handling:** Maturity index – Harvesting – Handling – Packing – Grading – Transporting – Storage and marketing.

Practical:

1. Identifying of horticultural crops
2. Practising in selection of location and site for orchard
3. Practising in planting systems for horticultural crops
4. Practising in methods of planting for horticultural crops
5. Practising in methods of irrigation for horticultural crops
6. Practising in methods of applying manures and fertilizers for horticultural crops
7. Practising in training techniques for horticultural crops
8. Practising in pruning techniques for horticultural crops
9. Acquiring knowledge about the application of plant growth regulators in horticultural crops
10. Practising different methods of storage for horticultural crops
11. Acquiring knowledge about the maturity indices for major fruits
12. Acquiring knowledge about the maturity indices for major vegetables
13. Visit to major orchards.

References:

1. Bose, T.K. 1986. Fruits of India – Tropical and subtropical, Nayaprakash, Calcutta.
2. Hartmann, H.T. and D.E.Kester. 1975. Plant propagation, Englewood cliffs, New Jersey, Prentice Hall.
3. Jitendra Singh 2004, Basic Horticulture, Kalyan Publications, New Delhi.
4. Kumar, N. 1993. Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
5. Shanmugavelu, K.S. 1989. Viticulture in India. Agro Botanical Publishers.

Learning out come

Unit	Vague out come	Most precious outcome
I	Studying the definition , Scope and importance of horticultural crops , Nutritive, aesthetic and industrial value of horticultural crops , Climatic zones	1. Understanding the nutritive, aesthetic and industrial value of horticultural crops. 2. Understanding the climatic zones of India
II	VI. Studying the Climate as a limiting factor ,effect of temperature, light, humidity and rainfall , Soil as a limiting factor , effect of soil characters on fruit production , Nutrient supply as a limiting factor, Role of major and minor nutrients. Deficiencies of some essential elements and control measures.	1. Understanding the climate and soil characters on horticultural crop production 2. Understanding the role of major and micro nutrients on horticultural crop production
III	Studying the selection of site , preparation methods ,layout of orchards ,planting season and planting methods	1. Understanding the selection of site and location for orchard 2. Understanding the different types of layout followed in orchard.
IV	Studying the orchard soil management ,irrigation methods , training and pruning techniques ,causes for unfruitfulness and role of growth regulators.	1. Understanding the drip irrigation system followed in orchard 2. Understanding the special training and pruning techniques
V	studying the maturity index, harvesting , handling ,packing , grading , transporting , storage and marketing.	1. Understanding the maturity indices for major fruits and vegetables 2. Understanding the different methods of storage

I Semester

15HORU0102- NURSERY MANAGEMENT FOR HORTICULTURAL CROPS (3+1)

Objectives:

- 1) To learn about nursery techniques propagation structures and equipments followed for Horticultural crops.
- 2) To learn about sexual and vegetative propagation techniques followed for horticultural crops .

I : Nursery care management: Planning and layout of nurseries – Media for propagating and growing nursery plants – Propagation structures and equipments – Sanitation – Care and handling of nursery plants – nutrition management for nursery plants - Pest and disease management of nursery plants.

II : Sexual propagation and Asexual propagation: Introduction – Advantages and limitations of Sexual propagation and Asexual propagation. Raising nursery for seedlings-techniques, portray nursery. Propagation by specialized vegetative structures: Bulbs – tubers – Tuberous roots and stems – Corms – Rhizomes – Runners – Offsets – Suckers.

III : Propagation on its own root systems

Cuttings : Types of cuttings – use of plant growth regulators in rooting
Layering : Types of layering.

IV: Propagation on the root system of other plants:

Grafting : Methods of grafting
Budding : Methods of budding – Bud certification programme. Factors affecting graft union and formation.

V: Micro propagation: Requirements – Methods of culturing plant tissues and organs – Limitations. Advantages and Limitations.

Practical:

1. Practising in preparation of nursery beds for raising mango and citrus root stock plants.
2. Practising in preparation of pot mixtures
3. Practising in potting and repotting of plants
4. Acquiring knowledge about the use of natural plant parts in vegetative propagation
5. Practising in preparation of cuttings
6. Acquiring knowledge about the use of growth regulators and the techniques in vegetative propagation
7. Practising in different methods of layering
8. Practising in different methods of grafting
9. Practising in different methods of budding
10. Practising in propagation structures
11. Practising in nutrition management for nursery plants
12. Practising in Pest and disease management of nursery plants
13. Visit to micro propagation unit

References:

1. Adriance, W. and R. Brison. 1979. Propagation of Horticultural plants, Tata McGraw Hill Publishing Com. Pvt. Ltd., New Delhi.
2. Hartmann, H.T. and D.E. Kester. 1975. Plant Propagation, Englewood cliffs, New Jersey, Printice Hall.
3. Jitendra Singh 2004, Basic Horticulture, Kalyain Publications, New Delhi.
4. N. Kumar. 1993. Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
5. Sadhu, M. 1991. Plant Propagation.

Learning Outcome

Unit	Vague out come	Most precious outcome
I	Studying the planning and layout of nurseries ,media for propagating and growing nursery plants , propagation structures and equipments , sanitation , care and handling of nursery plants , nutrition management for nursery plants , pest and disease management of nursery plants.	1. Understanding the planning and lay out of nursery for horticultural crops 2. Understanding the different types of propagation structures
II	Studying the definition , advantages and limitations , propagation by specialized vegetative structures: bulbs , tubers , tuberous roots and stems , corms , rhizomes , runners , offsets , suckers.	1. Understanding the definition and advantages and disadvantages of sexual and asexual propagation. 2. Understanding the propagation by specialized vegetative structures.
III	Studying the types of cuttings , use of plant growth regulators in rooting types of layering.	1. Understanding the different types of cutting with examples 2. Understanding the different types of layering with examples
IV	Studying the methods of grafting methods of budding , bud certification programme. factors affecting graft union and formation..	1. Understanding the different types of grafting with examples 2. Understanding the different types of budding with examples
V	Studying the requirements , methods of culturing plant tissues and organs , limitations. advantages and limitations.	1. Understanding the advantages and requirements of micro propagation 2. Understanding the procedure for micro propagation.

I Semester
15HORU0103- FRUIT PRODUCTION (3+1)

Objectives:

- 1) To learn about production technology of tropical , subtropical, Arid, Humid and temperate fruit crops.
- 2) To learn about special horticulture techniques followed for fruit crops.

- I. **Major tropical fruits:** Production technology of Mango, Banana, Grapes and Citrus.
- II. **Minor tropical fruits:** Production technology of Papaya, Sapota, Guava.
- III. **Arid zone fruits:** Production technology of Ber, Annonaceous fruits, Fig Amla, Pithocolobium, Jamun, Wood apple, Carissa and Pomegranate,
- IV. **Humid zone fruits:** Production technology of Pine apple, Mangosteen, Avocado, Jack, Passion fruit and Durian.
- V. **Temperate fruits:** Production technology of Apple, Plum, Peach , Pear and Strawberry

Practical:

1. Identifying and description of important varieties of fruit crops
- 2-5. Practising propagation technique of fruit crops
- 6-7. Practising production of fruit crops in field
- 8-9. Acquiring knowledge about the preparation of cost of cultivation for important fruit crops
- 10-11. Visit to commercial orchards.
- 12-13. Acquiring knowledge about the value added products of fruit crops

References:

- 1) Bose, T.K. 1990. Tropical and sub tropical fruits of India, Nayaprakash, Calcutta.
- 2) Hayes, W.B. 1960. Fruit growing in Indian Kitabistan Publishers.
- 3) Ranjit Singh. 1992. Fruits, National Book Trust, India.
- 4) Saini, G.S. 1997. A text book of fruit production, Aman Publishing House Ltd., Meerut, U.P.
- 5) Shanmugavelu, K.G. 1987. Production Technology of fruit crops, SBA Publications, Calcutta.

Learning Outcome

Unit	Vague out come	Most precious out come
I	Studying the production technology of Mango, Banana, Grapes and Citrus.	1. Understanding the production technology of Mango, Banana, Grapes and Citrus. 2. Understanding the physiological disorders of mango and citrus.
II	Studying the production technology of Papaya, Sapota and Guava.	1. Understanding the production technology of papaya, sapota and guava. 2. Understanding the maturity indices of sapota.
III	Studying the Production technology of Ber, Annonaceous fruits, Fig Amla, Pithocolobium, Jamun, Wood apple, Carissa and Pomegranate,	VI. 1. Understanding the Production technology of Ber, Annonaceous fruits, Fig Amla, pithocolobium, jamun, Wood apple, Carissa and Pomegranate, 2. Understanding the different varietal characters of Amla.
IV	Studying the production technology of Pine apple, Mangosteen, Avocado, Jack, Passion fruit and Durian.	1. Understanding the production technology of Pine apple, Mangosteen, Avocado, Jack, Passion fruit and Durian. 2. Understanding the pineapple propagation and planting.
V	Studying the Production technology of Apple, Plum, Peach, Pear and Strawberry	1. Understanding the Production technology of Apple, Plum, Peach, Pear and Strawberry 2. Understanding the pollinizer requirement for temperate fruit crops.

I Semester
15HORU0104-VEGETABLE PRODUCTION (3+1)

Objectives:

- 1.To learn about importance, classification and types of vegetable cultivation.
- 2.To learn about production technology of Solanaceous ,Malvaceous and Leguminous, Cucurbitaceous ,Crucifers, Bulb, Root , tuber and leafy vegetables

Unit I: Introduction: Definition – Importance of vegetables – Classification of vegetable crops – Types of vegetable cultivation – Crop rotation – Factors affecting vegetable cultivation.

Unit II:Production Technology of Solanaceous ,Malvaceous and Leguminous vegetables

Tomato, brinjal, chillies, bhendi, garden bean and cluster bean. , peas, beans,

Unit III: Production Technology Of Cucurbitaceous And Crucifers Vegetables

Gourds ,Melons,Chowchow,Pumpkin,Cucumber,Gherkin, Cabbage, Cauliflower,

Unit IV:Production Technology of Bulb, Root and tuber vegetables,

Onion, Garlic, Radish, Carrot and Beetroot, Potato, Tapioca and Sweet Potato.

Unit V: Production Technology of leafy and other vegetables

Amaranthus, Celery and Lettuce,Drumstick, curry leaf, and coccinea.

Practical:

1. Identifying and description of varieties of vegetables
2. Practising in raising nursery for vegetables
3. Practising in planting of vegetables
4. Practising in applying manures and fertilizers for vegetable crops
5. Acquiring knowledge about the important after cultivation practices followed for vegetables
6. Identifying of maturity indices for vegetables
7. Practising in harvesting of vegetables
8. Acquiring knowledge about the cost of cultivation for important vegetable crops.
9. Visit to vegetable field
10. Practising in packing of vegetables
11. Visit to vegetable market
12. Acquiring knowledge about the precision production technology of vegetables
13. Cultivation of vegetables under shade house, net house and poly house

References:

1. B.Choudhary. 1967. Vegetables, National Book Trust India, New Delhi.
2. Bose, T.K., M.G.Som and J.Kabir. 1993. Vegetable crops.
3. Jitendra Singh 2004, Basic Horticulture, Kalyain Publications, New Delhi
4. Saini, S.G. 1997. A text book of vegetable production. Aman Publishing House, Meerut, U.P.
5. Veeraraghavathatham, D., M. Jawaharlal, Seemanthini Ramadas. 1991. A guide on vegetable culture, A.E.Publication, Coimbatore.

Learning out come

Unit	Vague Out come	Most precious out come
I	Studying the definition, Importance of vegetables, Classification of vegetable crops, Types of vegetable cultivation, Crop rotation and Factors affecting vegetable cultivation.	1. Understanding the importance and classification of vegetables. 2. Understanding planning and layout of kitchen garden.
II	Studying the production technology of Tomato, brinjal, chillies, bhendi, cucurbits, garden bean and cluster bean. , peas, beans,	1. Understanding the production technology of Tomato, brinjal, chillies, bhendi, cucurbits, garden bean and cluster bean. , peas, beans, 2. Understanding the virus diseases and control measures for tomato and bhendi
III	Studying the production technology of Gourds ,Melons,Chowchow,Pumpkin,Cucumber, Gherkin, Cabbage, Cauliflower,	1. Understanding the production technology of Gourds ,Melons,Chowchow,Pumpkin,Cucumber,Gherkin, Cabbage, Cauliflower, 2. Understanding the importance of ethrel spray for cucurbitaceous vegetables.
IV	Studying the production technology of. Onion, Garlic, Radish, Carrot and Beetroot, Potato, Tapioca and Sweet Potato.	1. Understanding the production technology of Onion, Garlic, Radish, Carrot and Beetroot, Potato, Tapioca and Sweet Potato. 2. Understanding the physiological disorders of cauliflower and Carrot.
V	Studying the production technology of Amaranthus, Celery and Lettuce,Drumstick, curry leaf, and coccinea.	1. Understanding the production technology of Amaranthus, Celery and Lettuce,Drumstick, curry leaf, and coccinea. 2. Understanding the different species and varieties of amaranthus

I Semester
15HORU0105- COMMERCIAL FLOWER CULTIVATION (3+1)

Objectives:

- 1) To learn about production technology of commercial flower crops.
- 2) To learn about cut flowers, floral concrete extraction and value added products from commercial flower crops.

I. Production technologies of Scented Rose, Jasmine

II. Production technologies of Chrysanthemum, Marigold and Tuberose.

III. Production technologies of Crossandra, Celosia, Gamphrena and Nerium

IV. Production technologies of Gladiolus, Anthurium, Carnation, Dutchrose, Cut Chrysanthemum and Orchids

V. Production technologies of Aster, Dahlia and Gerbera.

Practical:

1. Identifying and description of varieties of commercial flower crops
2. Practising in propagation of commercial flower crops
3. Practising in planting of commercial flower crops
4. Practising in picking of commercial flower crops
5. Practising in packing of commercial flower crops
6. Visit to flower gardens
7. Visit to flower markets
8. Visit to essential oil extraction unit
9. Visits to orchitorium
10. Acquiring knowledge about the preparing cost of cultivation for chrysanthemum and marigold
11. Acquiring knowledge about the Preparing cost of cultivation for jasmine and tuberose
12. Visit to flower field
13. Visit to flower field

References:

1. Arora.,J.S.2007, Introductory Ornamental Hortiuculture, Kalyani Publishers, New Delhi.
2. Bose, T.K. and L.P. Yadav. 1989. Commercial flowers – Nayaprakash, Calcutta.
3. Chadha, K.L. and B. Choudhury. 1997. Ornamental Horticulture in India, ICAR, New Delhi.
4. Randhava, G.S. and A. Mukhopadhyay. 1986. Floriculture in India, Allied Publishers Pvt. LTd., New Delhi.
5. Vishnu swarup ,Garden flowers, ICAR Publications, New Delhi

Learning outcome

Unit	Vague out come	Most precious out come
I	Studying the production technology of scented rose, jasmine	1. Understanding the production technology of scented rose, jasmine 2. Understanding the floral concrete extraction from jasmine flowers
II	Studying the production technology of chrysanthemum, marigold and Tuberose.	1 Understanding the production technology of chrysanthemum, marigold and Tuberose. 2. Understanding weed management in tube rose
III	Studying the production technology of crossandra, celosia, gamphrena and nerium	1. Understanding the production technology of crossandra, celosia, gamphrena and nerium 2. Understanding the different types of Chrysanthemum and Marigold.
IV	Studying the Production technology of Gladiolus, Anthurium, carnation, dutchrose, cutchrysanthemum	1. Understanding the Production technology of Gladiolus, Anthurium, carnation, dutch rose, cut chrysanthemum 2 Understanding suitable gladiolus cultivars for cut flower production.
V	Studying the Production technology Aster, Dahlia and Gerbera.	1. Understanding the Production technology of Aster, Dahlia and Gerbera. 3. Understanding vase life and longevity of cut flowers.

I Semester

15AEXU0110-COMMUNICATION FOR MANAGEMENT (3+0)

Objectives:

1. To understand the concept and types of communication and its models
2. To learn the various management concepts and models
3. To understand the use of communication as a management tool.

I. Communication: Communication process – meaning, nature, scope, purpose, importance, elements, forms, types and models – Aristotle, Lasswell, Berlo, Shannon and Weaver and Leagans, Elements in communication process-description. Problems and barriers in communication.

II. Organization and management: Organizations – meaning – nature, concepts and types of organizations – mechanistic and organic, formal and informal, hybrid organizations – project, task force and matrix, Agricultural farms as formal organizations – management – meaning and functions, evolution of management thought and pioneers of management field.\

III. Concepts of management: Systems of management – four different systems, POSDCORB theory of management – Managerial role in an organization, scalar principle, delegation of authority, supervision, span of supervision, coordination, centralization Vs decentralization and decision making.

IV. Management communication: Meaning, functions and types of organizational communication and their importance in the management of farms. Role and significance of communication to management – Manager as a communicator and his communication settings – communication as a management tool – Problems in management communication and suggestions to overcome.

V. Organizational development: Organizational development – meaning, characteristics, objectives, process and benefits – Some motivational tools and techniques – Management information system – features, types, steps and benefits.

References:

1. Banerjee, M. 1996. Essentials of modern managements. Indian Book Distributing Company, New Delhi.
2. Berlo, David K. 1961. The process of communication,
3. Dahama, O.P. and O.P. Bhatnagar. 1996. Education and Communication for Development, Oxpord, IBH Puhlishing Co.Ltd, NewDelhi
4. Ray, G.L. 1991. Extension communication and management. Naya Prakash, Calcutta.
5. Seetharaman, Netaji. R., et.al. 1990. A Manual on Audio-visual Aids.

Learning out comes		
Unit	Vague out come	Most precious out come
I.	Studying the communication process	<ol style="list-style-type: none"> 1. Understanding the concepts of communication 2. Learning the models, elements of communication process 3. Understanding the problems in the communication process
II.	Learning about the organizations	<ol style="list-style-type: none"> 1. Learning about the features and types oof organizations 2. Understanding the agricultural farms as organizations 3. Understanding the meaning and functions of management.
III.	Learning about the various management concepts	<ol style="list-style-type: none"> 1. Understanding the various systems of management 2. Understanding the various management concepts
IV.	Studying about the organizational communication	<ol style="list-style-type: none"> 1. Learning about the types of organizational communication and their application 2. Understanding the application of communication as a management tool
V.	Learning about the organizational development	<ol style="list-style-type: none"> 1. Understanding the meaning, process and benefits of organizational development 2. Learning about the features, types and benefits of management information system.

II Semester

15H0RU0106-SPICES, CONDIMENTS AND PLANTATION CROPS (3+1)

Objectives:

- 1) To learn about production technology and processing of major, tree and seed spices.
- 2) To learn about production technology and processing technology of plantation crops and beverage crops

I. **Major spices:** Production technologies and processing of Cardamom, Pepper, Ginger and Turmeric.

II. **Tree spices:** Production technologies and processing of Clove, Nutmeg, Cinnamon, Garcinia

III. **Seed spices:** Production technologies of Coriander, Fennel, Fenugreek and Cumin.

IV. **Plantation crops:** Production Technologies of Rubber, Cashewnut, Arecanut, Coconut and Oil palm.

V. **Beverage crops:** Production technologies and processing of Coffee, Tea and cocoa.

Practical:

1. Identifying and description of varieties
2. Practising in propagation of ginger and Turmeric
3. Practising in propagation of seed spices like coriander and fenugreek
4. Practising in raising nursery.
5. Practising in after cultivation
6. Practising in training
7. Practising in pruning
8. Practices in fertilization
9. Visit to plantations to study the cultivation methods and processing.
- 10-12. Visit to Horticulture Research Station
13. Herbarium collection

References:

1. Kumar, N. Md. Abdul Khadar, P.Rangasami and I.Irulappan. 1993. Introduction to spices, plantation crops, medicinal and aromatic plants, Rajalakshmi Publishers, Nagercoil – 3.
2. Shanmugavelu, K.G. and N.Madhava Rao. 1987. Spices and plantation crops, India Book House, New Delhi.
3. Singh, V.B. and Kirtisingh. 1996. Spices, New age International Limited Pvt. Publishers, New Delhi.
4. Muhanan K.V. 2006 , Essentials of Plantation Science, Perte Books Publishers and Distributors, Calicut, Kerala.
5. Crop Production guide 1999, TNAU & Dept of Agriculture Publication.

Learning out come

Unit	Vague out come	Most precious out come
I	Studying the production technology and processing of Cardamom, Pepper, Ginger and Turmeric.	1). Understanding the production technology of Cardamom, Pepper, Ginger and Turmeric. 2) Understanding the processing of Cardamom, Pepper, Ginger and Turmeric.
II	Studying the production technology and processing of Clove, Nutmeg, Cinnamon and Garcinia.	1). Understanding the production technology of Clove, Nutmeg, Cinnamon and Garcinia. 2). Understanding the processing technology of Clove, Nutmeg, Cinnamon.
III	Studying the production technology of Coriander, Fennel, Fenugreek and Cumin.	1). Understanding the production technology of Coriander, Fennel, Fenugreek and Cumin. 2). Understanding the propagation technique followed for coriander.
IV	Studying the production Technology of Rubber, Cashewnut, Arecanut, Coconut and Oil palm.	1). Understanding the production Technology of Rubber, Cashewnut, Arecanut, Coconut and Oil palm. 2). Understanding rubber tapping technique
V	Studying the production technology and processing of Coffee , Tea and Cocoa.	1). Understanding the production technology of Coffee , Tea and Cocoa. 2). Understanding the processing of coffee, tea and Cocoa.

II Semester
15HORU0107-INDOOR AND OUTDOOR GARDENING (3+1)

Objectives:

- 1) To learn about importance, history, development, types of garden and garden components.
 - 2) To learn about landscaping principles, lawn making and principles of flower arrangement.
- I. **Introduction:** Importance – History and development of gardening – Hindu style – Buddhist garden – Moghul garden – Japanese garden – British garden.
- II. **Garden Plant components :** Arboretum – Shrubbery — Topiary – Edge – Hedge – Terrace garden, Flowering annuals and herbaceous perennials – Climbers and creepers – Ornamental palms – Ferns.
- III. **Garden Non plant components :** Rock garden – Water garden- Fountain- Statue- Arches- Pergola- Urns- Tubs.
- IV. **Landscaping:** Principles of landscaping – Lawn and lawn maintenance – Principles, planning and execution of private garden – Public garden and factory garden.
- V. **Indoor gardening:** Decorative plants – Bonsai – Principles of flower arrangement – Decoration with indoor plants for conference hall, living room, dining hall and verandah flower arrangement.

Practical:

1. Identifying of important ornamental trees
2. Identifying of important shrubs
3. Identifying of important climbers and creepers
4. Identifying of important edge and hedge plants
5. Identifying of important ferns, cacti and succulents
6. Practising in lawn making
7. Practising in lawn maintenance
8. Practising in planning and layout of home gardens
9. Practising in planning an layout of public gardens
10. & 11. Acquiring knowledge about the flowering annuals with reference to raising nursery, pricking, tipping and disbudding and preparation of main field and transplanting
12. Visit to botanical garden
13. Visit to Park

References:

1. Gopal Samy Iyengar ,1990, Complete Gardening In India ,IBH, India
2. Indoor gardening, Vishnu Swarup, ICAR, New Delhi.
3. Nambison, K.M.P. 1992. Design elements of landscape gardening. Oxford and IBH Publications, New Delhi.
4. Pratibha and P.Trivedi, 1990. Beautiful shrubs, ICAR, New Delhi.
5. Pratibha and P.Trivedi. 1987. Home Gardening. ICAR, New Delhi.

Learning out come

Unit	Vague outcome	Most precious out come
I	Studying the Importance, History and development of gardening, Hindu style , Buddhist garden, Moghul garden, Japanese garden and British garden.	1). Understanding the Importance, History and development of gardening. 2). Understanding the different features of various gardens.
II	Studying the Arboretum – Shrubbery — Topiary – Edge – Hedge – Terrace garden, Flowering annuals and herbaceous perennials – Climbers and creepers – Ornamental palms – Ferns.	1) Understanding the suitable plants for topiary, hedges and edges. 2) Understanding the classification of flowering annuals
III	Studying the Rock garden – Water garden- Fountain- Statue- Arches- Pergola- Urns- Tubs.	1). Understanding the suitable plants for rock and water garden. 2). Understanding the garden non- plant components
IV	Studying the Principles of landscaping, Lawn and lawn maintenance, Principles, planning and execution of private garden and Public garden and factory garden.	1). Understanding the landscaping principles. 2). Understanding lawn making method and maintenance.
V	Studying the Decorative plants, Bonsai, Principles of flower arrangement. Decoration with indoor plants for conference hall, living room, dining hall and verandah flower arrangement.	1). Understanding the flower arrangement principles. 2) Understanding the difference steps involved in making bonsai plants.

II Semester
15APPU0204-PEST AND DISEASE MANAGEMENT OF
HORTICULTURAL CROPS (3+1)

Objective :

To facilitate the students to learn and understand the Horticultural crops pests and disease symptoms and their management practices.

Theory

Study of important and common pests and diseases, with reference to the life cycle, symptoms and control measures of the following horticultural crops.

Unit I: Fruit crops: Mango, banana, grapes, citrus, ber, sapota, guava, pomegranate, papaya, apple, peach, pear and plum.

Unit II: Vegetable crops: Brinjal, bhendi, chillies, crucifers, cucurbits, potato, tomato and leafy vegetables.

Unit III: Flower crops: Jasmine, crossandra, marigold and rose.

Unit IV: Plantation crops: Tea, coffee and rubber.

Unit V: Spices and condiments: Cardamom, pepper, turmeric, ginger and coriander.

Practical:

1. Identification and observation of pests and diseases of fruit crops
2. Identification and observation of pests and diseases of vegetables crops
3. Identification and observation of pests and diseases of flowers crops
4. Identification and observation of pests and diseases of plantation crops
5. Identification and observation of pests and diseases of species and condiments
6. Collection, preservation and rearing of at least 10 insect pest which cause damage to horticultural crops
7. Submission of 20 specimens showing the damages caused by insects and diseases
- 8-9. Visit to nearby farmer's fields to learn the field problems related to pests and diseases
- 10-13 Field visits to commercial orchards.

References:

1. Govindasamy, C.V. and M.N. Alagianagalingam. 1986. Plant Pathology, Popular Book Depot, Chennai.
2. Kumar and Nigam. 1989. Economic and applied entomology, Emkay Publications, New Delhi.
3. Mehtotra, R.S. 1988. Plant pathology, Tata McGraw Hill Publishing Company, Ltd., New Delhi.
4. Nair, M.R.G.K. 1986. Insects and mites of crops in India, ICAR Publications, New Delhi.
5. Pradhan, S. 1983. Agricultural entomology and pest control, ICAR Publications, New Delhi.

Learning out come		
Unit	Vague out come	Most precious out come
I.	Studying the Pests and Diseases of Fruit crops.	1.Understanding the basic symptoms Pests and diseases Fruit crops 2.Understanding the important Pests and diseases management methods in Fruit crops
II.	Studying the Pests and Disease of Vegetables	1.Understanding the basic symptoms Pests and diseases of Vegetables 2.Understanding the important Pests and diseases management methods in vegetables
III.	Studying the Pests and Diseases of Spices & Condiments	1.Understanding the basic symptoms Pests and diseases of Spices & Condiments 2.Understanding the important Pests and diseases management methods in Spices & Condiments
IV.	Studying the Pests and Diseases of Plantation crops	1.Understanding the basic symptoms Pests and diseases of Plantation crops 2.Understanding the important Pests and diseases management methods in Plantation crops
V.	Studying the Pests and Diseases of Ornamental crops	1.Understanding the basic symptoms Pests and diseases of Ornamental crops 2.Understanding the important Pests and diseases management methods in Ornamental crops

II Semester
15HORU0108- FRUIT PRESERVATION (0+2)

Objectives :

1. To learn about importance and types of preservation for fruits
 2. To learn about value added products from fruits
- I. **Importance of fruit preservation** – Types of preservation – Temporary and permanent methods - Quality Standards – Regulations – Organic Production.
- II. **Preservation of squashes (Grapes, Orange)** – Selection of fruits – Preparation and preservation methods.
- III. **Preservation of crushes (Mango, Pineapple)** – Selection of fruits – Preparation and preservation methods.
- IV. **Preservation of Jams, Jellies - (Mixed fruit, Guava)** – Selection of fruits – Extraction of Pectin and preservation methods
- V. **Preservation of pickles** – (Tomato, Garlic, Mango) – Tomato sauce – FPO rules and regulations etc.

References:

1. Jitendra Singh 2004, Basic Horticulture, Kalyani Publications, New Delhi.
2. Kumar, N. 1993. Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
3. Premalata Mullick, 2000. Text Book of Home Science, Kalyani Publishers, New Delhi
4. Sri Lakshmi.N. 2007, Food Science, New Age International (P) Ltd., Publishers, New Delhi.
5. [WWW.newage Publishers .Com](http://WWW.newagepublishers.com)

Practical:

1. Practicing the preparation and preservation of grapes squashes
2. Practicing the preparation and preservation of Orange squashes
3. Practicing the preparation and preservation of Mango crushes
4. Practicing the preparation and preservation of pineapple crushes
5. Practicing the preparation and preservation of Guava Jams,Jellies
6. Practicing the preparation and preservation of mixed fruits Jams,Jellies
7. Practicing the preparation and preservation of Tomato pickles
8. Practicing the preparation and preservation of Tomato sauce
9. Practicing the preparation and preservation of Mango pickies
10. Practicing the preparation and preservation of Garlic pickies
11. Acquiring knowledge about the quality standards for fruits
12. Acquiring knowledge about the FPO rules and regulations
13. Visit to fruits preservation unit

II SEMESTER

15ACSU0201- COMPUTER FUNDAMENTALS AND OFFICE AUTOMATION (3+1)

OBJECTIVES

- To understand the basic concepts of computers
- To develop applications using MS Word, MS Excel and MS Powerpoint.

UNIT I: Definition of a computer - Computer terminologies - Anatomy of a computer - Generations of computers - Types of computers- Types of operating system - Types of programming languages - assembler - translator - compiler – cross compiler

[11 Hrs]

UNIT II: Input devices - Output devices - Storage devices - Source data entry devices. [8 Hrs]

UNIT III: MS-Word: Introduction - features - Document creation - Document editing: cursor movements - selecting text - copying text - moving text - finding and replacing text - Spelling and Grammar - Page setup - Mail Merge - Table creation. [8 Hrs]

UNIT IV: MS-Excel : Introduction - Advantages & applications - Organization of workbook - Editing a worksheet - Range - Formatting worksheet - Chart: creation - changing type - Print options - Built-in functions. [7 Hrs]

UNIT V: MS-Power Point: Introduction - features - creating presentation - viewing - saving and close presentation - Changing Layout - Changing Designs - Slide transition – Adding animation effects - inserting table, charts, pictures, clipart in presentation. [8 Hrs]

Reference Books:

1. Fundamentals of Information Technology, S.K.Bansal, A.P.H. Publishing company, New Delhi, 2002.
2. 2007 Microsoft Office System step by step, Joyce Cox, Joan Preppernau, Steve Lambert and Curtis Frye, 2007

OUTCOMES

Students should be able to

- Know the basic computer concepts.
- Understand the basic hardware devices.
- Create document in MS Word.
- Draw chart using MS Excel.
- Design presentation using MS Powerpoint

Electives
II SEMESTER

15AGRU0214-BIO-MANURES AND BIO-CONTROL AGENTS (3+1)

Objectives:

1. To teach the importance of bio-manures and bio-control agents
 2. To expose the students to the application of various bio-manures and bio-control agents
 3. To impart the skill in the preparation and application of various composts and organic nutrient sprays
- I. **Introduction:** Adverse Effects of Modern Agricultural Practices on and off the Farm- Impact of High Technology Agriculture-its contribution to Greenhouse Effect, Global Warming and Climate Change. Eco-Friendly Alternative Farming Techniques- Advantages of Organic Farming- Role of Bio-Manures in Soil Fertility and Soil Micro Flora. Bulky organic manures- types and usage. Concentrated organic manures- types and usage.
- II. **Bio-fertilizers and Organic nutrient sprays:** Bio-fertilizers- definition, types and methods of application. Liquid bio-fertilizers-benefits, characteristics, types- Rhizobium, azospirillum, azotobacter-methods of application and dosage. Mass production and application of Mycorrhizae, Cyanobacteria, Azolla. Organic nutrient sprays- meaning, advantages, types-panchakavya, dasakavya, jeevamirtha, ganajeevamirtha, beejamirtha, amirthakaraaisal, fish gunabajala, egg sap.
- III. **Composts and Composting techniques:** Composts- meaning, necessity, advantages and disadvantages, benefits and uses. Principles of composting. Types of composting-aerated Varanshi, Indore, Bangalore methods. Night soil composting, coir composting, Fortified, pit or trench, sugarcane trash, enriched, NADEP methods. Vermi- composting- advantages, nutritive value, types, methods, suitable spp., requirements, vermiculture bed, worm food, techniques involved, vermiwash.
- IV. **Bio-control agents:** Bio-control agents- definition, advantages, disadvantages, differences, types and characteristics. Parasites- production technologies of Trichogramma. Parasitoids- major types. Entomopathogenic virus, bacteria and fungi. Sex pheromone traps. Predators- definition, features and characteristics, mechanism, types, methods of predation. Important predators. Biological and taxonomical relationships of insect predators. Conserving parasites and predators.
- V. **Green manuring and Greenleaf Manuring:** Meaning, objectives, advantages and disadvantages. Green manures-desirable characteristics, types, nutrient contents. Greenleaf manures-desirable characteristics, types, nutrient contents. Agronomy of major Green manure crops.

Practical:

1. Studies on different bio-manures and its physical properties
2. Decomposition of organic matter and CO₂ evolution
3. Preparation of enriched compost
4. Preparation of Coir compost
5. Preparation of Vermi- compost
6. Preparation and application of Panchakavya and Dasakavya
7. Preparation and application of Jeevamirtha and Ganajeevamirtha
8. Preparation and application of Beejamirtha
9. Preparation and application of Fish gunbajala and egg sap
10. Preparation of NPV and CPV
11. Methods of application of bio-fertilizers
- 12 & 13. Visit to organic fields.

References:

- 1) Balekar, Subash (2011). Zerobudget Farming
- 2) Brady, N.C. 1985. The Nature and properties of soils. Eurasia Publishing House (P) Ltd., New Delhi.
- 3) Dilip Kumar Das – 2000. Introductory Soil Science, Kalyani Publishers, New Delhi . 111 002.
- 4) Palaniappan.S.P and K. Annadurai (1999), Organic Farming. Scientific Publishers (India),Jodhpur
- 5) Palaniappan, SP. and K. Annaduari. 1999. Organic farming: Theory and Practice, Scientific Publishers, Jodhpur.
- 6) Sahai, 1999. Fundamentals of soil. Kalyani Publishers, New Delhi.
- 7) Sharma K. Arun, 2002, A Hand Book of Organic Farming Agrobios (India) Jodhpur.
- 8) Subba Rao and Bhakya Raj, 1986. Agricultural Microbiology, Eastern Economy
- 9) Vyas, S.C., Smriti Vyas, Sameer Vyas and H.A. Modi. 1998. Biofertilizers and Organic farming, Akta Prakashan, Nadiao, pp. 252.

Learning out comes		
Unit	Vague out come	Most precious out come
I.	Studying the eco-friendly alternative farming technologies	<ol style="list-style-type: none">1. Understanding the impact and adverse effects of modern agricultural techniques2. Understanding the necessity and importance of various eco-friendly alternative farming technologies
II.	Learning about the bio-fertilizers and organic nutrient sprays	<ol style="list-style-type: none">1. Understanding the various types of bio-fertilizers and their methods of application2. Acquiring the skill in the preparation and application of various organic nutrient sprays.

III.	Learning about the various types of composts and composting techniques	1. Understanding the mechanism involved in the preparation of various types of composts and composting techniques
IV.	Studying about the various types of bio-control agents	1. Understanding the importance of use of bio-control agents in pest control. 2. Understanding the mechanism of action involved in the pest control through the use of bio-control agents
V.	Learning about the different types of green manures and Greenleaf manures	1. Understanding the necessity and importance of application of green manures and Greenleaf manures 2. Learning about the cultivation and application of green manures and Greenleaf manures.

II Semester-Electives
15HORU0109-COMMERCIAL CULTIVATION OF MEDICINAL AND
AROMATIC PLANTS (3+1)

Objectives:

1. To learn about production Technology of Medicinal, Aromatic and Indigenous herbs
2. To learn about processing Technology of Medicinal, Aromatic and Indigenous herbs
- I. **Introduction** : Importance and scope of medicinal and aromatic plants – Global Scenario – Species extinction – conservation techniques – distillation methods of essential oils.
- II. **Production technology for medicinal plants** : Medicinal yam – Senna – Fox glove – Sarpagandha.
- III. **Production technology for medicinal plants** : Periwinkle – Isubgol – Belladonna – Ipecac.
- IV. **Production technology for aromatic plants** : Lemon grass – Palmarosa – Citronella - Vetiver – Geranium – Patchouli.
- V. **Indigenous minor herbs** : Role of indigenous herbs in disease control – Indigenous herbs and their curative properties – Important herbal formulations.

Practical:

1. Identifying and description of varieties of Medicinal plants
2. Identifying and description of varieties of Aromatic plants
3. Practising in raising Nursery for Medicinal plants
- 4 – 5. Practising in cultivation methods of important Medicinal plants
- 6 – 7. Practising in cultivation methods of important Aromatic plants
8. Visit to Ayurvedic unit, Gandhigram trust
- 9 – 10. Visit to HRS, kodaikanal
11. Visit to an Oil Extraction Factory
12. Identifying of important Indigenous herbs
13. Acquiring knowledge about the Important herbal formulations

References:

1. Dr.S.K. Jain, Medicinal Plants. National Book Trust, India, New Delhi.
2. Kumar, N. 1993. Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
3. Kumar, N., D.Abdul Khadar, P. Rangasami and T.Irulappan. 1993. Introduction to spices, plantation crops, medicinal and aromatic plants, Rajalakshmi Publications, Nagercoil – 3.

Learning outcome:

Unit	Vague out come	Most precious out come
1	Studying the importance and distillation methods for medicinal and aromatic plants	1.Understanding the importance of Medicinal plants andAromatic plants 2.Understanding the distillation methods of essential oils of Medicinal plants andAromatic plants
2	Studying the production technology of medicinal yam,senna,fox glove and sarpagandha	1.Understanding the production technology of medicinal yam,senna,fox glove and sarpagandha 2. Understanding the Economic parts of medicinal yam,senna,fox glove and sarpagandha
3	Studying the production technology of periwinkle,isubgol,belladonna and ipecac	1.Understanding the production technology of periwinkle,isubgol,belladonna and ipecac 2.Understanding the Economic parts of periwinkle,isubgol,belladonna and ipecac
4	Studying the production technology of lemon grass,palmarosa,citronella,vetiver,geranium and patchouli	1.Understanding the production technology of lemongrass,palmarosa,citronella,vetiver,geranium and patchouli 2.Understanding the distillation methods of essential oils of Aromatic plants.
5	Studying the Role of Indigenous herbs in disease control and Important herbal formulations	1.Understanding the Indigenous herbs in disease control. 2.Understanding the Important herbal formulations