B.Voc.

Organic Agriculture and Enterprise Development Programme

Syllabus

(with effect from July 2018)

School of Agriculture and Animal Sciences

The Gandhigram Rural Institute
(Deemed to be University)
Gandhigram

B.VOC. ORGANIC AGRICULTURE AND ENTERPRISE DEVELOPMENT

SCHEME OF EVALUATION

I SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
18ENGV0101	GEC	Technical writing and communication skills	3	40	60	100
18YOGV0001	GEC	Yoga Education	1	50	-	50
		Total	**4**			**150**
18OAEV0101	SDC	Fundamentals of Agriculture	2	20	30	50
18OAEV0102	SDC	Fundamentals Of Agriculture - Practical	2	50	-	50
18OAEV0103	SDC	Fundamentals of Organic Farming	3	40	60	100
18OAEV0104	SDC	Fundamentals of Organic Farming - Practical	3	60	40	100
18OAEV0105	SDC	Basics of Livestock Production	2	20	30	50
18OAEV0106	SDC	Basics of livestock Production - Practical	2	50	-	50
18OAEV0107	SDC	Production of Organic Inputs	3	40	60	100
18OAEV0108	SDC	Production of Organic Inputs - Practical	3	60	40	100
18OAEV0109	SDC	Participatory Hands on Training	6	100	-	100
		Total	**26**			**700**
		Grand Total	**30**			**850**

II SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
	GEC	Computer Fundamentals and Office Automation	4 (3+1)	24+24	36+16	100
	GEC	Sports and Games/ Fine Arts	1	50		50
		Total	**5**			**150**
18OAEV0210	SDC	Farming systems and Sustainable Agriculture	2	20	30	50
18OAEV0211	SDC	Farming systems and Sustainable Agriculture - Practical	3	60	40	100
18OAEV0212	SDC	Soil and Crop Management	2	20	30	50
18OAEV0213	SDC	Soil and Crop Management - Practical	3	60	40	100
18OAEV0214	SDC	Water and Irrigation Management	2	20	30	50
18OAEV0215	SDC	Water and Irrigation Management - Practical	2	50	-	50
18OAEV0216	SDC	Basics of Seed Production	2	20	30	50
18OAEV0217	SDC	Basics of Seed Production - Practical	3	60	40	100
18OAEV0218	SDC	Participatory Hands on Training	6	100	-	100
		Total	**25**			**650**
		Grand Total	**30**			**800**

III SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
18OAEV0319	GEC	Environmental Studies and Disaster Management	2	20	30	50
18OAEV0320	GEC	Environmental Studies and Disaster Management - Practical	2	50	-	50
	GEC	NSS/ Shanti Sena	1	50	-	50
		Total	**5**			**250**
18OAEV0321	SDC	Organic Farming Practices for Field Crops	2	20	30	50
18OAEV0322	SDC	Organic Farming Practices for Field Crops - Practical	2	50	-	50
18OAEV0323	SDC	Organic Farming Practices for Horticultural Crops	2	20	30	50
18OAEV0324	SDC	Organic Farming Practices for Horticultural Crops- Practical	2	50	-	50
18OAEV0325	SDC	Organic Plant Protection for Field and Horticultural Crops	2	20	30	50
18OAEV0326	SDC	Organic Plant Protection for Field and Horticultural Crops - Practical	3	60	40	100
18OAEV0327	SDC	Field Training	6	100	-	100
18OAEV0328	SDC	Participatory Hands on Training	6	100	-	100
		Total	**25**			**550**
		Grand Total	**30**			**800**

IV SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
18OAEV0429	GEC	Marketing and Supply Chain Management	3	40	60	100
18OAEV0430	GEC	Marketing and Supply Chain Management- Practical	3	60	40	100
		Total	**6**			**200**
18OAEV0431	SDC	Processing of Organic Agricultural Produces	3	40	60	100
18OAEV0432	SDC	Processing of Organic Agricultural Produces - Practical	3	60	40	100
18OAEV0433	SDC	Processing of Organic Horticultural Produces	3	40	60	100
18OAEV0434	SDC	Processing of Organic Horticultural Produces – Practical	3	60	40	100
18OAEV0435	SDC	Organic Livestock and Poultry Production	3	40	60	100
18OAEV0436	SDC	Organic Livestock and Poultry Production- Practical	3	60	40	100
18OAEV0437	SDC	Participatory Hands on Training	6	100	-	100
		Total	**24**			**600**
		Grand Total	**30**			**1000**

V SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
18CSAU0534	GEC	Computer – Tally	4 (3+1)	24+24	36+16	100
		Total	**4**			**100**
18OAEV0538	SDC	Institutions and Organizations for Organic Growers	2	20	30	50
18OAEV0539	SDC	Organic Standards and Certification	3	40	60	100
18OAEV0540	SDC	Organic Standards and Certification - Practical	3	60	40	100
18OAEV0541	SDC	Food safety and Quality Standards	4	40	60	100
18OAEV0542	SDC	Field Training	6	100	-	100
18OAEV0543	SDC	Educational Tour	2	-	-	50
18OAEV0544	SDC	Participatory Hands on Training	6	100	-	100
		Total	**26**			**600**
		Grand Total	**30**			**700**

VI SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
18OAEV0645	GEC	Entrepreneur skills, Agribusiness and Project Management	3	40	60	100
18OAEV0646	GEC	Entrepreneur Skills, Agribusiness and Project Management - Practical	3	60	40	100
		Total	**6**			**200**
18OAEV0647	SDC	Quality Control of Agricultural Inputs	3	40	60	100
18OAEV0648	SDC	Quality Control of Agricultural Inputs - Practical	3	60	40	100
18OAEV0649	SDC	ITKs in Organic Farming	3	40	60	100
18OAEV0650	SDC	ITKs in Organic Farming - Practical	3	60	40	100
18OAEV0651	SDC	Project Work	6	-	-	100
18OAEV0652	SDC	Participatory Hands on Training	6	100	-	100
		Total	**24**			**600**
		Grand Total	**30**			**800**

SEMESTER I

18ENGV0101 TECHNICAL WRITING AND COMMUNICATION SKILLS - 3 CREDITS

OBJECTIVES

- To improve the English language skills of students with very limited abilities to use the language;
- To focus on the language skills of the learners in a graded manner.

LEARNING OUTCOME

- Students know improve the English language skills with very limited abilities to use the language;
- Students focus on the language skills of the learners in a graded manner.

THEORY

Unit I : **Grammar:** What is grammar? – The capital letter – Nouns and pronouns and Tenses.

Unit II : **Listening:** Teacher narrations

Unit III : **Speaking Skills:** Self – introduction - Descriptions of persons, objects, places

Unit IV : **Reading and Vocabulary:** Graded reading comprehension passages

Unit V : **Writing Skills:** Sentence construction - Descriptive Paragraph writing, Précis writing, Essay and letter writing, CV and Resume.

TEXTBOOKS

1. Course material prepared by the English faculty

REFERENCES

1. Seaton, Anne & Y.H. Mew. Basic English Grammar Book 1. Irvine: Saddleback, 2007. Print.

SEMESTER I

18YOGV0001 YOGA EDUCATION – 1 CREDIT

OBJECTIVE

To gain practical knowledge about yogic practices.

LEARNING OUTCOME

Students should be able to

- Evaluate the importance of preparatory exercise
- Demonstrate the suryanamaskar and various asanas
- Utilize the meditation techniques
- Compare mudras and bandhas
- Assess the difference between asanas and physical exercises

THEORY

UNIT	CONTENTS	LECTURE SCHEDULE
Unit I	**History of Yoga** – Definition of the term Yoga – Comprehensive Nature and Scope Yoga – Aims and Objectives of Yoga – Yoga as an ideal system of physical culture.	2
Unit II	**Schools of yoga**: Pantanjali yoga – Astangayoga – Tantrayoga – Mantrayoga – Hathayoga – Layayoga –Rajayoga- Jnanayoga – Bhaktiyoga – Karmayoga- Difference between practice of asanas and physical exercise.	2
Unit III	**Asanas Practice**: Meditative asanas: Sukhasana- Ardha Padmasana- Padmasana – Vajrasana- Standing Asanas- Tadasana – Trikonasana- Parivrtta Trikonasana- Vrikshasana- Sitting Asanas- Baddha Konasana- Janusirasana- Paschimottanasana- Ustrasana- Vakrasana- Gomukhasana- Suryanamaskar	5
Unit IV	**Asanas Practice**: Prone asanas: Makarasana- Bhujanagasana- shalabhasana- Dhanurasana- Supine Asanas: Pavanamuktasana- Sethubandasana- Navasana- Savasana	4
Unit V	**Pranayama Practice**: Sectional Breathing- Nadisuddhi- Bhramari- Bhastrika- Kapalapathi- Introduction to Bandhas- Mudras- Dharana (Trataka) – Dhyana	3

TEXT BOOKS

1. Swami Satyananda Saraswathi, (2008): Asana Pranayama Mudra, Bandha (IV Revised Edition): Bihar School of Yoga, Munger, India.

REFERENCE BOOKS

1. Asanas, Swami Kuvalayananda, Kaivalaydhama, Lonavla, 1993.
2. Yoga for all, Maharishi Patanjali, Sahni Publications,2003
3. Yoga for Health, Institute of Naturopathy and Yogic Sciences, Bangalore, 2003.
4. Yoga for Health, K. Chandra Shekar, Khel Sahitya Kendra, Theni, 2003.
5. Yoga for the Modern Man, M.P. Pandit, Sterling Publishers Private Limited, New Delhi, 1987.
6. Yoga for You, Indira Devi, Jaico Publishing house, Chennai, 2002.

SEMESTER I

18OAEV0101 FUNDAMENTALS OF AGRICULTURE – 2 CREDITS

OBJECTIVES

- To teach the history, importance, concept and principles of Agriculture

LEARNING OUTCOME

- The students can understand the basic Importance, principles and need of agriculture.
- To acquire sufficient knowledge on history of Agriculture and Crop management.

THEORY

Unit 1 : **Agricultural Heritage:** History of agricultural development in the world and - India Agriculture heritage in India - Development of Human Culture and Beginning of Agriculture– Features of Village- Agriculture in the sangam Literature of Tamil Nadu - Astronomy – Prediction of Monsoon rains; Parashara, varamihira, -Panchanga in comparison to modern methods - Ancient soil classification and Maintenance of Soil Productivity.

Unit II : **Introduction to Agriculture :** Agriculture– Definition ,Importance and scope – Branches of agriculture –Development of scientific agriculture – National and International Agricultural Research Institutes

Unit III : **Basics concepts of Agriculture**: Agronomy– Definition and scope. Agro-climatic zones of India and Tamil Nadu – Agro ecological zones of India - Crops and major soils – Classification – Economic and agricultural importance in India and Tamil Nadu - Factors affecting crop production – climatic – Edaphic – biotic-physiographic and socio economic factors -

Unit IV **Agricultural practices:** Tillage– objectives – types of tillage – modern concepts of tillage – main field preparation - Seeds – Seed rate – sowing methods – Germination - Planting geometry -Inter cultivation – Thinning – Gap filling and other intercultural operations - Irrigation – Time and methods – Modern techniques of irrigation – Drainage and its importance – Manures and fertilizers-Plant protection (IPM)- weed management- - Harvesting – Threshing , drying and Storage.

Unit V : **Cropping and farming system:** Cropping pattern and cropping system – Intensive cropping- Crop rotation , Intercropping, Mixed cropping, Relay cropping and Multi-tier cropping– Dry farming – Gardening in Ancient and Medieval Period – Arbori Horticulture – Orchards - Traditional Technical Knowledge - Vegetable farming – Floriculture– Perfumes and Medicinal Plants - Role of cattle and other domestic animals- management of cattle for draught and milk – indigenous breeds.

LECTURE SCHEDULE

1. History of agricultural development in the world and India
2. Agriculture heritage in India and tamilnadu

3. Development of Human Culture and Beginning of Agriculture
4. Features of Village
5. Agriculture in the sangam Literature of Tamil Nadu
6. Prediction of Monsoon rains; Parashara, varamihira, -Panchanga in comparison to modern methods
7. Ancient soil classification and Maintenance of Soil Productivity
8. Introduction, definition ,scope and importance of agriculture
9. Branches of agriculture and Development of scientific agriculture
10. National and International Agricultural Research Institutes
11. Agronomy– Definition and scope
12. Agro-climatic zones of India and Tamil Nadu
13. Agro ecological zones of India
14. Classification of crops and major soils
15. Economic and agricultural importance in India and Tamil Nadu
16. Factors affecting crop production- climatic , Edaphic , biotic, physiographic and socio economic factors
17. Tillage- objectives, importance, Types of tillage and modern concepts of tillage.
18. Main field preparation
19. Seeds – Seed rate – sowing methods – Germination -Planting geometry
20. Inter cultivation – Thinning – Gap filling and other intercultural operations
21. Irrigation – Time and methods – Modern techniques of irrigation
22. Drainage and its importance
23. Manures and fertilizers
24. Plant protection (IPM)- weed management
25. Harvesting – Threshing , drying and Storage
26. Cropping pattern and cropping system
27. Intensive cropping- Crop rotation , Intercropping
28. Intensive cropping - Mixed cropping, Relay cropping and Multi-tier cropping
29. Dry farming – Gardening in Ancient and Medieval Period
30. Arbori Horticulture – Orchards - Traditional Technical Knowledge
31. Vegetable farming - Floriculture– Perfumes and Medicinal Plants
32. Role of cattle and other domestic animals, management of cattle for draught and milk management of indigenous breeds.

18OAEV0102 FUNDAMENTALS OF AGRICULTURE – PRACTICAL – 2 CREDITS

Identification of crops and varieties- Identification of organic inputs- green manures and green leaf manure crops and seeds-Nursery preparation for rice and other crops- seed treatment techniques- study of tools and machineries- Methods of irrigation in field crops- Methods of organic inputs application and management-Practicing harvesting and processing

PRACTICAL SCHEDULE

1. Study of the identification of crops and varieties
2. Study of the identification of organic inputs
3. Study on green manures and its uses
4. Study on green leaf manure crops
5. Study on seeds of rice and other crops
6. Study on Nursery preparation for rice and other crops
7. Study on seed treatment techniques
8. study of tools and machineries
9. Methods of irrigation in field crops
10. Methods of organic inputs application and management
11. Practicing harvesting and processing
12. Field visit

TEXT BOOKS:

1. Ayachit, S.M. (Tr) 2002. Kashyapiya Krishisukti (A treatise on Agriculture by Kashyapa). Agri – History Bulletin No. 4. Asian – Agri History foundation, Secundrabad.

2. Choudhary, S.L., Sharma, G.S. and Nene, Y.L. 2000. Ancient and medieval history of Indian agriculture and its relevance to sustainable agriculture in the 21st century. Proceedings of the summer school held from 28 May to 17 June 1999. Rajasthan College of Agriculture, Udaipur, India

3. Nene, Y.L. and Choudhary, S.L. 2002. Agricultural heritage of India. Asian Agri – History foundation, Secundrabad.

4. Randhawa, M.S., 1980 – 86. A history of Agriculture in India. Vol. I, II, III and IV. Indian council of Agricultural Research, New Delhi.

REFERENCE BOOKS:

1. Raychaudhuri, S.P. 1964. Agriculture in ancient India. Indian council of Agricultural Research, New Delhi.

2. Balasubramaniyan,P and SP. Palaniyappan. 2002. Principles and Practices of Agronomy, Agrobios (India), Jodhpur.

3. Dahama. A. K. 1996. Organic farming for Sustainable Agriculture. Agro Boranical Publishers (India), Bikaner.

4. Reddy. S. R. 1999.Principles of Agronomy, Kalyani Publishrs, New Delhi.

E - References:

1. **www.crida.org**
2. **www.tnau.ac.in/agriportal**

SEMESTER I

18OAEV0103 FUNDAMENTALS OF ORGANIC FARMING – 3 CREDITS

OBJECTIVES

- To teach the history, importance, concept and principles of organic farming
- To train on organic nutrients preparation, plant protection methods and organic certification

LEARNING OUTCOME

- The students can understand the basic Importance, principles and need of organic farming.
- The students can learn the methods of organic farming, organic nutrients preparation, methods of plant protection and organic certification.

THEORY

Unit I : **Importance and Development of Organic Farming:** History of Alternative Agricultural Development in India- Green Revolution and its Impact- Need for Organic Farming, Conventional Vs Organic Farming- Problems and Prospects of Organic Farming, Scope in India and Tamil Nadu-

Unit II : **Concept and principles:** Principles, Components , Characteristics - Benefits of Organic Farming – Types of farming- Organic farming**,** Natural farming**,** Biodynamic Farming, Permaculture, Regenerative Agriculture, LEISA, Zero-budget Farming- Climate Smart Agriculture- Conservation Agriculture - Indigenous Farming.

Unit III : **Organic Sources of nutrients**- Soil organic carbon, Manures and other inputs- on farm and off farm sources- organic waste recycling- methods of recycling- intercropping, crop rotation- green manures, green leaf manures- cover crops, mulching – Bio soil and fertilizers.

Unit IV : **Organic plant protection methods:** Preventive, physical, cultural, mechanical and biological measures- Bio-intensive weed, insect and disease management.

Unit V : **Organic Certification :** Organic certification – NPOP guidelines- Certification Types and Agencies in India- Crop production standards- Quality considerations- labeling and accreditation process- Marketing and export of organic products

LECTURE SCHEDULE

1. History of alternative agricultural development in India.
2. Importance and development of organic farming
3. Introduction – Definition of Farming and Organic Farming, Development of Organic Farming.
4. Stages in Agricultural Development
5. Green Revolution and its Impact
6. Need for organic farming.
7. Benefits, advantages, merits and demerits of conventional and Organic Farming
8. Problems and prospects of organic farming.
9. Scope of organic farming in India and Tamil Nadu
10. National and International status of organic Agriculture.
11. Concept and Principles of organic farming
12. Components and Essential characteristics of organic farming
13. Benefits of organic farming
14. Types of farming – organic farming, Natural farming
15. Biodynamic farming, Permaculture
16. Regenerative agriculture, LEISA, Zero budget farming
17. Climate smart agriculture and conservation agriculture ,Indigenous farming method
18. Importance of organic sources of nutrients
19. Soil organic carbon, Manures and other inputs
20. On farm and off farm sources
21. Organic waste recycling and Methods of recycling
22. Intercropping
23. Crop rotation
24. Green manures
25. Green leaf manures
26. Cover crops and Mulching
27. Bio soil and fertilizers
28. Organic plant preventive methods- preventive, physical, cultural measures
29. Organic plant preventive methods- mechanical and biological measures

30. Bio-intensive weed, insect and disease management
31. Organic certification
32. NPOP guidelines
33. Certification types and agencies in India
34. Crop production standards
35. Quality considerations, labeling and accreditation process
36. Marketing and export of organic products

18OAEV0104 FUNDAMENTALS OF ORGANIC FARMING – PRACTICAL – 3 CREDITS

Visit of organic farms to study the various components and their utilization; Preparation of enriched compost, vermicompost, bio-fertilizers/bio-inoculants and their quality analysis; Indigenous technical knowledge (ITK) for nutrient, insect pest, disease and weed management; Cost of organic production system; Post harvest management; Quality aspect, grading, packaging and handling.

PRACTICAL SCHEDULE

1. Visit to organic farms
2. Study of the various components in organic farming and their utilization
3. Visit to compost production units
4. Preparation of enriched compost
5. Preparation of vermicompost
6. Preparation of bio-fertilizers
7. Compost Quality
8. Bio- fertilizer quality
9. Indigenous technical knowledge (ITK) for nutrient management
10. Indigenous technical knowledge (ITK) for insect pest and disease management
11. Indigenous technical knowledge (ITK) for weed management
12. Cost of organic production system
13. Study on post harvest management of agricultural produce
14. Study on quality, grading, packaging and handling of agricultural produce
15. Study on storage and transportation of agricultural produce
16. ESE practical Examination

TEXT BOOKS

1. Dahama, A.K. 2002, Organic farming for sustainable Agriculture Agrobios (India), Jodhpur
2. Palaniappan.S.P and K.Annadurai 1999, Organic Farming. Scientific Publishers (India) Jodhpur.
3. The Organic Farming Source Book (1996), The other India press, Mapusa, Goa.

REFERENCE BOOKS

1. Bill Mollison.1990, Permaculture- A Designers manual. The Deccan development society, Hyderabad.
2. Masanobu Fukuoka. 1997, The Natural Way of Farming- The Theory and Practice of Green philosophy, Book venture, Madras.
3. Jerome,J. Jaison. 1998, Biodynamic farming, Sornapriya press, Tirunelveli.
4. Pretty.N.Jules.1995, Regenerative Agriculture. Vikas publishing house, New Delhi.

SEMESTER I

18OAEV0105 BASICS OF LIVESTOCK PRODUCTION- 2 CREDITS

OBJECTIVES

The General objective of this course is to establish basic knowledge of how to manage and operate dairy farm and farm animals

- This course is designed to impart basic technical knowledge and skills required for entry level positions or to successfully run a dairy farm enterprise by developing competencies concerning the breeding of dairy cattle, housing and health care.
- This course is designed to impart basic technical knowledge and skills required manage calves, heifers, lactating animals and pregnant animals.

LEARNING OUTCOME

- The students will gain technical knowledge and skills required to manage cattle, sheep, goat and swine.
- The students will obtain skill for managing the health of animals and understand the various diseases that infect animals.

THEORY

Unit I : Livestock in India – Role of livestock augmenting for rural income and employment – Livestock population and census – Contribution of livestock in Indian economy

Unit II : Introduction to Animal husbandry- Common animal husbandry terms – Taxonomy of cattle, sheep, goat, pig and buffalo-Common farm management- Disinfection-Quarantine

Unit III : Common vices in livestock – Livestock production systems – Landless system-Grassland system– Mixed farming system –Rainfedsystem- Irrigated system – Intensive system – Semi intensive system – Extensive system- Housing management of cattle

Unit IV : Livestock products – Site for selection of farm building – General principles of planning for farm housing –Roof patterns – Arrangement of farm buildings –

Cattle and Buffalo breeds –Gir-Red sindhi –Sahiwal –Kangayam –Hallikar – Umblacherry –Pulikulam –Alambadi – Jersey – HF –Brownswiss –Murrah-Surti – Niliravi –Jaffrabadi – Toda.

Unit V : Calf management – Care of new born calf – Common ailments in Newborn calf- Colostrum feeding - Calf starter – Milk replacers – Breeding management –Bull management- Feeding management- Milking methods.

LECTURE SCHEDULE

1. Livestock population in India
2. Role of livestock augmenting for rural income and employment
3. Livestock population and census
4. Contribution of livestock in Indian economy
5. Introduction to Animal husbandry
6. Common animal husbandry terms
7. Taxonomy of cattle, sheep, goat, pig and buffalo
8. Common farm management
9. Disinfection- Quarantine
10. Common vices in livestock
11. Livestock production systems
12. Landless system- Grassland system– Mixed farming system
13. Rainfed system- Irrigated system
14. Intensive system – Semi intensive system – Extensive system
15. Housing management of cattle
16. Livestock products
17. Site for selection of farm building
18. General principles of planning for farm housing
19. Roof patterns
20. Arrangement of farm buildings
21. Cattle and Buffalo breeds
22. Gir-Red sindhi – Sahiwal
23. Kangayam – Hallikar – Umblacherry
24. Pulikulam – Alambadi – Jersey – HF – Brownswiss
25. Murrah- Surti – Niliravi – Jaffrabadi – Toda.
26. Calf management
27. Care of new born calf
28. Common ailments in newborn calf
29. Colostrum feeding - Calf starter – Milk replacers
30. Breeding management
31. Bull management

32. Feeding management
33. Milking methods.

18OAEV0106 BASICS OF LIVESTOCK PRODUCTION – PRACTICAL- 2 CREDITS

Familiarizing with of body parts of farm animals, Identification of breeds of Livestock, Identification of breeds of sheep and goat- Handling of Livestock- Cattle head and limb restraint techniques-Casting of cattle- disbudding of calves-Tattooing-Ear tagging-Dentition and ageing-body weight by body measurement-grooming-Castration of bull calves-Transportation of cattle

PRACTICAL SCHEDULE

1. Points of Dairy Cattle, Buffalo and Bull
2. Identification of breeds of cattle and buffalo
3. Identification of breeds of sheep and goat
4. Handling of Livestock
5. Cattle head and limb restraint techniques
6. Casting of cattle
7. Hands on training in disbudding of calves
8. Tattooing
9. Ear tagging
10. Dentition and ageing
11. Estimation of body weight by body measurement
12. Hands on training in grooming
13. Castration of bull calves
14. Transportation of cattle

REFERENCE BOOKS

1. Banerjee, G.C., 2006. Text book of Animal Husbandry 8thEd.Oxford and IBH Publishing Company Ltd., New Delhi.
2. ICAR, 2013. Hand book of Animal Husbandry, 4th Ed., ICAR Publication, Pusa, New Delhi.

3. Jagadish Prasad, 2002. Principles and practices of Dairy Farm Management, 3rd Ed. Kalyani Publishers, Ludhiana.
4. Ranjhan, S.K., and N.N.Pathak, 2003. Text book on buffalo production, 4 Ed. Vikas Publishing House Pvt. Ltd., New Delhi.

SEMESTER I

18OAEV0107 PRODUCTION OF ORGANIC INPUTS – 3 CREDITS

OBJECTIVE

To teach and train the students in the production of composts, bio nutrient solutions, biofertilizers, bio control agents and bio pesticides.

LEARNING OUTCOME

The students will be able to prepare the various inputs used in organic farming.

THEORY

Unit I : **Organic manures/Composting:** Importance- Types of organic manure-bulky, Concentrated- FYM- Green manures and green leaf manures- characteristics- benefits- Methods of application- concentrates- blood meal, bone meal- Nutrient content- Basics and methods of composting - benefits and methods of application

Unit II : **Bio nutrients:** Importance – Preparation of Panchagavya, Jeevamirtham. Amirthakaraisal, Aavootam, cow horn manure, Vermiwash

Unit III : **Biofertilizers :** Microbial inoculants- Types, Production- Methods of application, Uses

Unit IV : **Bio-control agents:** Predators, parasitoids and microbial agents, pheromone traps,

Unit V : **Bio-pesticides:** Preparation, use and applications of various botanicals for pest control, leaf extracts, non chemicals- allelochemicals

LECTURE SCHEDULE

1. Definition, importance and benefits of manures
2. Its effect on soil and crop

3.	Classification of organic manures
4.	Nutrient levels and availability of Bulky Organic Manures (BOM)
5.	Farm yard manure – characteristics and benefits
6.	Green manures and green leaf manures – characteristics, Method of application and benefits
7.	Concentraed Organic Manures (COM) – Different types, nutrient content and availability
8.	Preparation of different types of compost I
9.	Preparation of different types of compost II
10.	Micro-organisms involved in composting
11	Factors influencing composting
12.	Biodegradation and importance of CN ratio
13.	Importance and advantages of vermicomposting
14.	Methods of vermicomposting and earthworm species involved
15.	Vermiculture and utility of vermiwash
16.	Preparation of Panchagavya and Jeevamirtham.
17.	Preparation of Amirthakaraisal, Aavootam, cow horn manure
18.	Bio - fertilizers and their types
19.	Nitrogen fixing microbes- Rhizobium, Azotobacter, Azospirillum, BGA and Azolla and their mass production
20.	Nitrogen fixation- benefits of nitrogen fixing plants and trees
21.	Importance and benefits of phosphorus solubilising micro organisms
22.	Methods of application of biofertilizers
23.	Preparation of bio nutrient solutions I
24.	Preparation of bio nutrient solutions II
25.	Method of application of bio nutrient solutions.
26.	Bio agents, its principles, definition and its importance.
27-28.	Important Predators and Parasitoids used in plant protection.
29- 30.	Important Microbial agents used in plant protection.
31-32.	Other beneficial insects
33-34	Principles, Preparation and use of important botanical in Agriculture
35-36	Preparation of Important herbal extracts, liquid extracts for pest and disease control

18OAEV0108 PRODUCTION OF ORGANIC INPUTS – PRACTICAL – 3 CREDITS

Preparation of different types of compost -Preparation of Vermicompost -Identification of Green and Green leaf manures-Testing of compost maturity- Study of biofertilizers- Preparation of organic nutrient solutions- Panchagavya, Jeevamirtham, preparation of biopesticides from various botanicals.

PRACTICAL SCHEDULE

1. Preparation of compost from farm wastes
2. Preparation of coir pith compost
3. Practicing different methods of composting
4. Preparation of vermicompost
5. Preparation of vermiwash
6. Testing of compost quality
7. Identification of green manures and green leaf manures
8. Practicing application of green manures and green leaf manures in the field
9. Preparation of bio-inoculum
10. Visit to biofertilizer unit
11. Preparation of panchagavya and jeevamirtham
12. Preparation of Amirthakaraisal, Aavootam
13. Preparation of cow horn manure
14. Important Predators and Parasitoids used in plant protection
15. Preparation and use of important botanicals in pest management
16. ESE practical Examination

TEXT BOOKS

1. Dahama, A.K. 2002, Organic farming for sustainable Agriculture Agrobios (India), Jodhpur
2. Palaniappan.S.P and K.Annadurai 1999, Organic farming. Scientific Publishers (India) Jodhpur.
3. Roger, B. Yepson, 1976. Organic plant protection, Rodale Pr

SEMESTER I

18OAEV0109 PARTICIPATORY HANDS ON TRAINING – 6 CREDITS

OBJECTIVES

- To give the student hands on training about various agricultural technologies
- To expose the students to farmer's fields, agro industries and institutes

LEARNING OUTCOME

- The students will gain hands on training of various techniques in agriculture
- The students will become aware and enriched with the knowledge on organic crop production
- The students will gain knowledge about production, value addition, labeling, certification and marketing of various organic products.

The students will be placed in three different agricultural enterprises in groups and they will be exposed to that particular enterprise and allowed to practice themselves from seed to seed. The produce obtained out of this learning experience will be marketed by themselves and the profit will shared among them. Composting, Vermicomposting, Bio nutrient solution preparation.

HANDS ON TRAINING

1. Composting
2. Vermicomposting
3. Bio nutrient solution preparation

SEMESTER II

18CSAU02A1 Computer Fundamentals and Office Automation- 4 credits

Unit I : **Computer concepts:** definition of a computer – origin of computer-characteristics-computer terminologies- Anatomy of a computer- generations of computers –types of computers – types of operation system –types of programming languages- Assembler- translator – Compiler – cross complier- Discussion on recent trends and technology

Unit II : **Hardware devices**-Input devices – key board – mouse –pointing devises-output devices – printers-plotters-monitors-Storage devices – floppy-Compact disk-external Hard disk- pen drive- Flash Drive-Source data entry devices-Digital camera- Scanners- Voice recognition System- fax machine-microphone-Surprise test/slip test

Unit III : **MS-Word-** introduction- features- Document creation – Document editing : cursor movements –Selection text – copying text – moving text – Finding and replacing text- Spelling and Grammar- page setup – Table creation-Mail Merge- Test on MS word shortcut keys

Unit IV **MS-Excel-** introduction- Advantages and applications- Organization of work book – Editing a worksheet- Range – Formatting work sheet – Chart: creation – changing type- print options Built-in functions- Test on Excel Functions

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- Checking the creativity of Students

Lecture schedule:

1) Definition of a computer –Origin of Computer- Characteristics
2) Computer terminologies- Anatomy of a computer
3) Generations of computers - Types of computers
4) Operating system and types
5) Types of programming languages & its translators
6) Compiler – cross compiler
7) Discussion on recent trends and technology
8) Input devices –Keyboard-mouse-pointing devices
9) Output devices - printers- plotters- monitors
10) Storage devices
11) Source data entry devices
12) fax machine – microphone
13) Surprise test/ slip test
14) MS-Word: Introduction - features
15) Document creation - Document editing

16) Finding and replacing text - Spelling and Grammar
17) Page setup - Table creation.
18) Mail Merge
19) Test on MS word shortcut keys
20) MS-Excel : Introduction - Advantages & applications
21) Organization of workbook –
22) Editing a worksheet
23) Range - Formatting worksheet
24) Chart: creation - changing type - Print options
25) Built-in functions
26) Test on Excel Functions
27) MS-Power Point: Introduction – features
28) Creating presentation - viewing - saving and close presentation
29) Changing Layout - Changing Designs
30) Adding animation effects
31) Transitions sound and speed
32) Inserting table, charts,
33) Inserting pictures, clipart in presentation
34) Checking the creativity of Students

18CSAU02A1 Computer Fundamentals and Office Automation

Preparation of Bio data , Agenda, Minutes, Circular Letters, Letters to various sectors, Mail Merge, Designing a News Paper- Preparation of Payrolls, Student mark list creation, Invoice & Stock Maintenance, Charts for Business Analysis, Use of Financial Functions- Preparation of the Advertisement, Animation, Transition Effects, Display Board, Audio & Video Presentation

PRACTICAL SCHEDULE:

1) Bio-data
2) Different Letters
3) Time Table Creation
4) Greeting Card Creation
5) Designing News Paper
6) Mail Merge
7) Preparation of Payrolls
8) Preparation of Student Mark list
9) Invoice & Stock Maintenance
10) Text, Date & Time Functions
11) Mathematical & Statistical Functions
12) Chart preparation
13) Power point Presentation by editing master slide
14) Power point Presentation with custom animation

SEMESTER II

SPORTS AND GAMES/ FINE ARTS – 1 CREDIT

SPORTS AND GAMES

Unit I : Concept and meaning of Physical Education- Definition of Physical Education- Aims and Objectives of Physical Education- Scope of Physical Education

Unit II : Origin of games(basket ball, ball badminton, cricket, foot ball, hockey, kabaddi, khokho, Tennikoit, Volley ball)- Basic skills of anyone of the major games (basket ball, Volley ball, kabaddi and foot ball etc.,) and two events Track and Field events-Intramural and Extramural tournaments- Recreational activities

Unit III : Common athletic injuries and their treatment personal hygiene- safety education with special reference to play field- modem trends in Physical Education- Counseling against doping, drug addiction, smoking, alcoholism- nutrition and sports diet

Unit IV : Meaning of Yoga- Definition of Yoga- Aims and OBJECTIVESs of Yoga- Scope of yoga-Need and Importance of Yoga in the modern era.

Unit V : The wheel of Yoga-Eight limbs of yoga - Gandhiji's contribution of Yoga Meaning and objectives of Meditation - various types of meditation - Difference between yoga and Physical Exercises - Therapeutical aspects of yoga and its applications.

SEMESTER II

FINE ARTS

Unit I : **Art History and Aesthetics:** What is art and what is art History? What constitutes art and how do we define it? The Classical Concept of art. Theory of Art as Expression. Aesthetic theories of Art.

Unit II : **Indian Art:** Do art and architecture perform functions and have a role to play in society? The role and importance of the museum as a site for cataloguing and preserving art, and projecting certain defined notions that have a bearing on the study of art and architecture will also be focused upon

Unit III : **Indian Architecture:** Prescriptive texts and the making of early Indian art and architecture. Was the science' of art and architecture developed as a concomitant of the artistic and architectural developments in early India?

Unit IV : **Types of Architecture:** Domestic (dwellings), public institutional (step-wells, rest-houses, hospitals) and religious institutional will be focused upon. The focus will be on the material sources at particular monument sites such as Sanchi, Amaravati, Ajanta, Ellora, Khajuraho, Tanjavur, Mahabalipuram, SravanaBelagola, Bhubaneshwar and Mount Abu. (There may be other sites added or dropped from this list depending on the newer literature available.)

Unit V : **Trends and Developments:** How do we understand the different structures that emerge over a long period of time within a monument or when a monument no longer has a living significance for the people in its vicinity? Are symbols remnants of the primitive mentality or do they also evolve over time? How do we understand ornamentation? Finally, is there an Indian art and architecture?

SEMESTER II

18OAEV0210 FARMING SYSTEMS AND SUSTAINABLE AGRICULTURE - 2 CREDITS

Unit I : Sustainable Agriculture- definition- Ecological Concerns-Economic and Social Concerns- Impact on Human Health

Unit II : Concept and principles : Agrarianism-Agroecology-Alternative farming - Best Management Practices (BMPs)- Biodiversity - Agrobiodiversity - Community Supported Agriculture (CSA)- Conservation Buffer strips.

Unit III : **Concept of Tillage :** Definition and Objectives and advantages- Types of tillage -Tilth ; Conservation Tillage- Modern concept of Tillage- Tillage implements- Nursery – Types of nursery and Land management

Unit IV : **Cropping system:** Crop rotations- Definition and advantages- Intensive cropping - Intercropping- Mixed cropping, Multitier cropping, Sequential cropping, Cover cropping, Catch cropping, Bund cropping- Need and advantages- indices- LER, HI and CEY

Unit V : **Integrated farming systems** (IFS): Definition, Advantages, Types of IFS- IFS for different ecosystems- components of IFS-, Cropping based IFS- Livestock based IFS, Tree based IFS, Interaction based IFS, Case studies in IFS- Resource recycling in IFS.

THOERY SCHEDULE

1. Sustainable Agriculture- definition
2. Ecological Concerns
3. Economic and Social Concerns
4. Impact on Human Health
5. Agrarianism- Concept and principles
6. Agroecology- Concept and principles
7. Alternative farming - Concept and principles
8. Best Management Practices (BMPs) - Concept and principles
9. Biodiversity - Concept and principles
10. Agrobiodiversity - Concept and principles
11. Community Supported Agriculture (CSA) - Concept and principles
12. Conservation Buffer strips- Concept and principles

13. Concept of Tillage
14. Definition ,Objectives and advantages
15. Types of tillage -Tilth
16. Conservation Tillage
17. Modern concept of Tillage
18. Tillage implements
19. Nursery
20. Types of nursery
21. Land management
22. Cropping system
23. Crop rotations- Definition and advantages
24. Intensive cropping
25. Intercropping
26. Mixed cropping
27. Multitier cropping
28. Sequential cropping
29. Cover cropping
30. Catch cropping
31. Bund cropping- Need and advantages
32. Indices- LER, HI and CEY
33. **Integrated farming systems** (IFS): Definition, Advantages
34. Types of IFS- IFS for different ecosystems-Components of IFS-Cropping based IFS
35. Livestock based IFS-Tree based IFS
36. Interaction based IFS-Case studies in IFS- Resource recycling in IFS

18OAEV0211 FARMING SYSTEMS AND SUSTAINABLE AGRICULTURE – PRACTICAL – 3 CREDITS

Tillage – tools and implements for tillage operation- Minimum tillage and different methods practiced- zero tillage, stubble mulch tillage, Study on crop rotation and mixed cropping techniques- study of different methods of organic farming- IFS suitable for different situation- Wet land , Garden land and dry land based IFS- Components of various IFS system- Visit to near by farming system practiced by Progressive farming community.

PRACTICAL SCHEDULE:

1. Tillage
2. Tools and implements for tillage operation
3. Minimum tillage
4. Different methods practiced

5. Zero tillage
6. Stubble mulch tillage
7. Study on crop rotation
8. MID SEMESTER EXAMINATION
9. Mixed cropping techniques
10. Study of different methods of organic farming
11. IFS suitable for different situation
12. IFS for different ecosystems
13. Livestock based IFS-Tree based IFS
14. Interaction based IFS-
15. Case studies in IFS
16. Resource recycling in IFS
17. IFS-Wet land
18. IFS-Garden land
19. IFS-Dry land based IFS
20. Components of various IFS system
21. Visit to near by farming system practiced by Progressive farming community
22. FINAL PRACTICAL EXAMINATION

SEMESTER II

18OAEV0214 WATER AND IRRIGATION MANAGEMENT – 2 CREDITS

UNIT I **Importance of Irrigation:** Role of water in plant growth- Need for irrigation - Water resources of India and Tamil Nadu-Sources of Irrigation- Direct and indirect benefits of irrigation.

UNIT II **Surface and Sub-Surface irrigation methods:** Flooding, border strip, furrow, beds and channel method of irrigation – merits and demerits.

UNIT III **Pressurised irrigation methods:** **S**prinkler and drip irrigation- – layout, suitability, merits and scope- Fertigation- Methods to improve WUE- Conjunctive use of surface and ground water-

UNIT IV **Water harvesting and conservation**; Water harvesting and recycling runoff collection, drainage of excessive water, excavated ponds, In-situ moisture conservation practices- bunding – compartmental bunding, BBF- Mulching- run-off water harvesting- vegetative barriers.

UNIT V **Drainage and problems in water use:** Drainage-Definition- Effects of water logging, Benefits of Drainage- Classification of Drainage- surface Drainage- Merits and Demerits- Subsurface drainage- Quality of irrigation water.

Theory schedule

1. Importance of Irrigation- Role of water in Plant growth
2. Need for irrigation
3. Water resources in India and Tamil Nadu
4. Sources of Irrigation
5. Benefits of Irrigation
6. Direct benefits of irrigation and Indirect benefits of irrigation
7. Irrigation methods- surface irrigation
8. subsurface irrigation
9. Pressurized irrigation methods
10. Surface irrigation methods- Flooding, Border strip irrigation methods – merits and demerits
11. Surface irrigation merits- Furrow method of irrigation, Beds and channel method of irrigation – merits and demerits
12. Pressurised irrigation methods-Sprinkler irrigation and drip irrigation methods- importance and advantages
13. Sprinkler irrigation method- Layout, suitability, merits and demerits and scope
14. Drip irrigation method- Layout, suitability, merits and demerits and scope
15. Fertigation – definition- Methods to improve Water use Efficiency(WUE)
16. Conjunctive use of surface and ground water
17. Water harvesting- Recycling of runoff water collection- Drainage of excess rain water
18. Excavated ponds - types and its advantages
19. In-situ soil moisture conservation- need for conservation of soil moisture- Cultural/Agronomic methods- Mechanical methods- biological methods

20. Agronomic methods- Addition of organic matter, summer ploughing, mulching, contour cultivation- strip cropping
21. MIDSEMESTER EXAMINATION
22. Mechanical methods of soil moisture conservation-Basin listing, Bunding, Ridges and furrows, Tied ridging,random tied ridging, Broad bed and furrow , Dead furrow and after crop establishment
23. Biological methods of soil moisture conservation
24. Pasture farming, strip cropping with grasses ley farming and vegetative barriers
25. Drainage – definition- Effects of water logging, Benefits of drainage
26. Classification of drainage
27. Surface drainage, Sub surface drainage- merits and demerits
28. Sub surface drainage- ,merits and demerits of sub surface drainage
29. Quality of irrigation water
30. ESE EXAMINATION

18OAEV0215 WATER AND IRRIGATION MANAGEMENT – PRACTICAL – 2 CREDITS

Soil moisture estimation, measurement of irrigation water, Calculation of irrigation water based on source, water flow, soil moisture status and depth of irrigation, land leveling and land shaping- beds and channels- Ridges and furrows, Broad Bed and furrow(BBF), Compartmental Bunding (CB) method of irrigation, drip and sprinkler irrigation systems, crop water requirement, Scheduling of irrigation, irrigation structures, water harvesting and conservation- seed hardening and mulching.

Practical schedule

1. Soil moisture estimation
2. measurement of irrigation water
3. Calculation of irrigation water based on source, water flow, soil moisture status and depth of irrigation, land leveling and land shaping
4. beds and channels- Ridges and furrows
5. Broad Bed and furrow(BBF)
6. Compartmental Bunding (CB)
7. method of irrigation,
8. drip and sprinkler irrigation systems
9. crop water requirement,
10. Scheduling of irrigation
11. irrigation structures
12. water harvesting and conservation
13. seed hardening and mulching
14. ESE PRACTICAL EXAMINATION

SEMESTER II

18OAEV0212 SOIL AND CROP MANAGEMENT – 2 CREDITS

Objective :

To develop knowledge about elements of soil and its management and to inculcate about the soil nutrient resources *viz.*, manures, fertilizers and biofertilizers.

Learning outcome:

The students can understand about the basics of soils and their influencing parameters with relevant to soil fertility, fertilizers and manures and they can develop confidence about the Nutrient Management and fertilizer recommendation

THEORY

Unit I : **Basics of soil:** Soil- Definition- Composition of soil – Types of soil found in India and Tamil Nadu- Physical and chemical properties of soil.

Unit II : **Soil-Fertility:** Importance–Soil fertility and productivity – Organic matter– Humus- Role on fertility.- Classification – Bulky Organic Manures (BOM) and Concentrated Organic Manures (COM) – Availability – Advantages - Nutrient levels – Green Manures (GM) and Green Leaf Manures (GLM) – Methods of Application - Their Benefits and Significance

Unit III : **Composting technology:** Composting –Importance - Effect on Soil and Crop - Classification – CN Ratio - Microbes Involved-.- Methods of Compost – Biocomposting- Vermicomposting –Definition - Earth Worms - Importance and Advantages - Suitable Species for Composting - Methods of Vermicomposting - Vermiculture – Vermiwash and its Utility - Bio compost Production- biogas slurry

Unit IV : **Biofertilizers and Bio - Inoculants:** Biofertilizers – Nitrogen fixing Microbes - *Rhizobium, Azotobacter, Azospirillum*, BGA and Azolla – Mass Production, Phosphorus Solubilising Micro Organisms – Methods of Application.

Unit V : **Problem soils and management:** Types- Soil physical, chemical, biological constraints- Management - Organic amendments and application

LECTURE SCHEDULE

1. Definition and composition of soil
2. Types of soil found in India
3. Types of soil found in Tamil Nadu and chemical properties of soil.
4. Physical properties of soil and its importance
5. Soil texture, Soil structure, Soil colour, Soil temperature
6. Particle density, Bulk density, Pore space, Consistency
7. Soil air and Soil water
8. Chemical properties of soil. Soil colloids pH, EC.
9. Definition and importance–Soil fertility and productivity
10. Influence of Organic matter on soil fertility-
11. Classification of organic manures Bulky Organic Manures (BOM) and Concentrated Organic Manures (COM) –
12. Availability, Advantages, Nutrient levels, Green Manures (GM) and Green Leaf Manures (GLM)
13. Methods of Application , Benefits and Significance
14. Definition of Composting , its Importance , Effect on Soil and Crop
15. Factors influencing composting
16. Methods of Composting
17. Biocomposting – Production of bio-composts
18. Vermicomposting –Definition, importance and Advantages
19. Earth Worms - Suitable Species for Composting
20. Methods of Vermicomposting
21. Vermiculture, Vermiwash and its Utility
22. Bio gas Production and nutritive value of biogas slurry
23. Definition of Biofertilizers, types of biofertilizers and methods of Application
24. Nitrogen fixing Microbes - *Rhizobium, Azotobacter, Azospirillum*, BGA and Azolla
25. Phosphorus Solubilising Micro Organisms –.
26. Mass production of biofertilizers
27. Management of Soil physical constraints
28. Management of Soil chemical constraints

29. Management of Soil biological constraints

30. Organic amendments and application

18OAEV0213 SOIL AND CROP MANAGEMENT – PRACTICAL – 3 CREDITS

Collection and processing of soil samples and water samples - Determination of soil texture, colour, pH, EC, organic matter, study of organic manures - Preparation of different types of compost -Preparation of Vermicompost –compost maturity, Identification of Green and Green leaf manures - Study of biofertilizers- Preparation of organic nutrient solutions.

PRACTICAL SCHEDULE

1. Collection and processing of soil samples
2. Determination of pH and EC in soil samples
3. Determination of soil texture
4. Determination of soil colour
5. Collection of water samples
6. Analysis of soil organic carbon
7. Identification of manures
8. Preparation of bio compost by Bangalore and Coimbatore methods
9. Preparation of Vermicompost
10. Identification of different species of earthworms
11. Compost maturity indices
12. Identification of Green and Green leaf manures
13. Study of biofertilizers
14. Preparation of organic nutrient solutions.
15. ESE practical Examination

Text books

1. Biswas, T.D. and Mukherjee, S.K. 1997. *Text book of Soil Science*. Tata McGraw Hill Publishing Co. Ltd., New Delhi
2. Daji, A.J. 1970. *A Text Book of Soil Science*. Asia Publishing House, Madras
3. Dhanasekaran, K., Poonkodi, P., Singaravel, R and.Raghupathy, B 2003, *Fundamentals of Soil Science*. Om Sakthi Pathippagam, Chidambaram
4. Dilip Kumar Das. 1997. *Introductory Soil Science*. Kalyani Publishers, Ludhiana
5. Donahue, R.L., Miller, T.W. and Shickluna, J.C. 1987. *Soils – An introduction to Soils and Plant Growth*. Prentice Hall of India (P) Ltd., New Delhi

SEMESTER II

18OAEV0216 BASICS OF SEED PRODUCTION – 2 CREDITS

UNIT I **Seed and seed quality:** Seed and grain- Organic and Conventional seeds- Indigenous Seed conservation methods- Seed quality characteristics-Classes of seeds-Supply and demand.

UNIT II **Agencies and Regulations for organic seed production:** National, International agencies of Government and Non-Governmental – Regulations for organic seeds - Organic Seed Testing centers-quality-Seed Certification

UNIT III **Plant Breeding in Seed Production:** Domestication-selection-Types of plant materials- Genetic resources- Participatory Plant Breeding- Seed community- Seed production techniques in major crops-cereals, pulses, oilseeds, fibres and vegetables.

UNIT IV **Organic Seed Production:** Choice of crop varieties –Traditional quality seed selection techniques-Pre-germinative practices- Crop management strategies- Organic farming techniques- Seeds and sowing-Manuring- Biofertilizers- Mulching- Panchagavya- Integrated Pest Managements practices- Challenges and Factors affecting organic seed production.

UNIT V **Harvest and Post-harvest processing:** Method of harvest**,** Threshing-post-harvest processing-seed cleaning, drying and separation for grain cereals and vegetables -Organic Seed treatment-priming-pelleting.

THEORY SCHEDULE

1) Seed –seed structure-classification of seeds
2) Seed technology-definition-introduction and importance
3) Chemical composition of seeds
4) Seed quality
5) Factors affecting seed quality
6) Classes of seed-generation system of seed multiplication
7) Organic Seed certification
8) National and international agencies of organic seed production

9) Regulation of organic seed production
10) Organic seed testing centers
11) Plant breeding –introduction -Domestication
12) Plant genetic resources
13) Participatory plant breeding
14) Seed community-seed village concept
15) Organic seed production in cereals
16) Organic seed production in millets
17) Organic seed production in pulses
18) Organic seed production in oil seeds
19) Organic seed production in fibres
20) Organic seed production in important vegetables
21) Traditional quality seed production techniques
22) Organic farming techniques- Organic seed treatment
23) IPM in organic seed production
24) Seed drying-seed processing
25) Seed storage-seed marketing
26) Intellectual properties Rights

18OAEV0217 BASICS OF SEED PRODUCTION – PRACTICAL – 3 CREDITS

Collection of seed varieties, exploration of wild species, floral biology of cereal crops, pulse crops, oil seed crops, seed germination, viability, vigour, presoaking of seeds for germination, seed structure-visit to organic seed production farm.

PRACTICAL SCHEDULE

1) Identification of seed and seed structure
2) Study of structure and morphology in important agricultural crops
3) Study of structure and morphology in important horticultural crops
4) Floral biology of cereal crops-pulses crops, oil seed crops
5) Seed production field to study isolation distance and rouging
6) Seed sampling mixing and dividing
7) Seed purity analysis

8) Seed germination tests
9) Seed vigour tests
10) Seed viability tests
11) Seed health tests
12) Organic seed certification
13) Visit to organic seed production farms
14) Visit to seed testing laboratories
15) Visit to seed processing units
16) ESE Practical Examination

SEMESTER III

18OAEV0319 ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT – 2 CREDITS

Unit I : **Introduction to Environmental Science and Ecology:** Environmental Science - definition, scope and importance; Ecosystems - Structure and function of an ecosystem. Energy flow in the ecosystem. Food chains -food webs and ecological pyramids.

Unit II : **Natural Resources and biodiversity:** Natural Resources: Renewable and non-renewable resources. Status, degradation, over exploitation, management and conservation of Land resources, Water resources, forest resources, Mineral resources and Energy resources. Biodiversity – definition and types. Hot-spots of biodiversity. Threats to biodiversity: Conservation of biodiversity:

Unit III : **Environmental Pollution:** Environmental Pollution: definition, cause, effects and control measures of soil, water, air pollution. Green House effect - Global warming and Climate change - Impact on agriculture and other natural resources. Environmental protection- National and state level organizations. Global treaties – Conventions. Legislation to protect the environment.

Unit IV : **Disaster and Impact Assessment:** Definition, introduction to natural and manmade disaster, Levels of disasters, History on natural disasters in India, Role of IT, remote sensing, GIS and GPS in disaster preparedness. weather forecasting and early warning systems, flood forecasting agricultural drought monitoring and forecasting.

Unit V : **Disaster Risk Reduction and policies for Disaster Management:** Contingency Planning for Disaster Risk Reduction: Disaster management Act and Policies in India, Existing schemes and government policies to tackle agricultural disasters.

Theory schedule:

1. Introduction to Environmental Science and Ecology
2. Environmental Science - definition, scope and importance
3. Ecosystems - Structure and function of an ecosystem
4. Energy flow in the ecosystem
5. Food chains -food webs and ecological pyramids.
6. Natural Resources and biodiversity
7. Natural Resources: Renewable and non-renewable resources
8. Status, degradation, over exploitation, management
9. conservation of Land resources
10. Water resources
11. forest resources
12. Mineral resources
13. Energy resources
14. Biodiversity – definition and types
15. Hot-spots of biodiversity
16. Threats to biodiversity
17. Conservation of biodiversity
18. Environmental Pollution
19. Definition, cause, effects and control measures of soil pollution
20. Definition, cause, effects and control measures of water pollution
21. Definition, cause, effects and control measures of air pollution
22. Green House effect
23. Global warming and Climate change
24. Impact on agriculture and other natural resources
25. Environmental protection
26. National and state level organizations
27. Global treaties – Conventions. Legislation to protect the environment
28. Disaster and Impact Assessment: Definition, introduction
29. Natural and manmade disaster, Levels of disasters
30. History on natural disasters in India

31. Role of IT, remote sensing, GIS and GPS in disaster preparedness
32. Weather forecasting and early warning systems
33. Flood forecasting agricultural drought monitoring and forecasting
34. Contingency Planning for Disaster Risk Reduction
35. Disaster management Act and Policies in India
36. Existing schemes and government policies to tackle agricultural disasters

SEMESTER III

18OAEV0320 ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT – PRACTICAL- 2 CREDITS

Environmental sampling and preservation - Biodiversity assessment in Agricultural system, Water quality analysis: pH, EC and TDS, Acidity, Alkalinity, Water hardness, DO and BOD, COD, *E.coli*, Assessment of Air pollution: Suspended Particulate Matter (SPM) - Assessment of heavy metal pollution in soil – Field Visits: Contaminated site, Common Effluent Treatment Plant - Visit to flood /Tsunami / Earth quake affected areas.

PRACTICAL SCHEDULE:

1. Environmental sampling and preservation
2. Biodiversity assessment in Agricultural system
3. Water quality analysis: pH, EC
4. Water quality analysis: TDS,TSS
5. Water quality analysis: Acidity, Alkalinity
6. Water quality analysis: Water hardness
7. Water quality analysis: DO and BOD
8. Water quality analysis: COD
9. Assessment of E.coli in water samples
10. Assessment of Air pollution: Suspended Particulate Matter (SPM)
11. Assessment of heavy metal pollution in soil
12. Visit to contaminated site
13. Visit to common Effluent Treatment Plant
14. Visit to flood /Tsunami / Earth quake affected areas

References

1. Balakrishnamoorthy 2005. Environmental Management. Prentice-Hall of India Private Ltd. New Delhi.
2. P.D.Sharma,2009,Ecology and environment, Rastogi Publication, Meerat, India.
3. William P.Cunningham and Mary ann Cunnugham, 2007. Priniciples of Environmental Sciences, Tata McGraw hill Publication company, New Delhi.
4. Stanley E.Manhan,1997. Environmental Sciences and Technology. Lewis Publication New York.
5. Sharma P.D.2006.Environmental Microbiology. Narosa Publishers, New Delhi.

SEMESTER III

NSS/ SHANTHI SENA- 1 CREDIT

NSS

Unit I : NSS - History, Philosophy, Principles and objectives

Unit II : Working with people— Methods and Techniques

Unit III : NSS - Regular Programme: objectives, activities - role and responsibilities of volunteers

Unit IV : NSS Special Camping Programme: objectives, activities - role and responsibilities of volunteers

Unit V : Evaluation of the NSS activities - Tools and Techniques

SHANTHI SENA

Unit I : Shanti Sena- Meaning and conceptual frame work - historical development

Unit II : Shanti Sena in India and abroad- Contributions of Mahatma Gandhiji, Khan Abdul, Ghaffar Khan, VinobaBhave and Jeyaprakash Narayan

Unit III : Organisation and functions of Shanti Sena- Shanti Kendras, All India ShanthiSena Mandal; Peaceful resolution of conflicts, Peace Making, Alternative to Defense and Violence.

Unit IV : Experiments in Modem times- World Peace Brigade, Peace Brigade International, U.N. Peace Keeping Force, Truth and Reconciliation Commission and Experiments of Gandhigram Rural Institute

Unit V : Skills and Training for Shanti Sena- Skills of First Aid and Skills for management, Peace Making Skills(Conflict Resolution and Counseling Transforming oneself into a ShandSaink.

SEMESTER III

ORGANIC FARMING PRACTICES FOR FIELD CROPS – 2 credits

Organic method of cultivation from sowing to harvest

Unit I **:** Cereals- Rice , Maize

Unit I **:** Millets- Sorghum, Cumbu ,Ragi

Minor millet- Tenai, Varagu, Samai, Panivaragu, Kudiraivali.

Unit III **:** Pulses-Redgram, Blackgram, Bengalgram cow pea, Horse gram

Unit IV **:** Oilseeds- Groundnut, Sesamum, Sunflower, Coconut

Unit V **:** Commercial Crops- Cotton, Jute, Sugarcane and Tobacco

LECTURE SCHEDULE :

1. Introduction – organic agriculture and field crops
2. Agricultural classification of field crops
3. Importance's of Organic manures
4. Cereals – Cultivation practice of Maize
5. Cereals – Organic system in Maize
6. Cereals – Cultivation practices of Rice
7. Cereals – Organic system in Rice
8. Millets – Cultivation practice of Sorghum
9. Millets – Organic system in Sorghum
10. Millets – Cultivation practice of Sorghum
11. Millets – Organic system in Sorghum
12. Millets - Cultivation practice of Tenai and Samai
13. Millets – Organic system in Tenai and Samai
14. Millets - Cultivation practice of Varagu and panivaragu
15. Millets – Organic system in Varagu and Panivaragu
16. Millets - Cultivation practice of Kuthiraivali
17. Millets – Organic system in Kuthiraivali
18. Pulses - Cultivation practices of Redgram and Bengalgram
19. Pulses – Organic system in Redgram and Bengalgram
20. Pulses - Cultivation practices of Black gram

21. Pulses – Organic system in Block gram
22. Pulses - Cultivation practice of Cow pea and Horsegram
23. Pulses – Organic system in Cow pea and Horsegram
24. Oilseeds - Cultivation practice of Groundnut
25. Oilseeds – Organic system in Ground
26. Oilseeds - Cultivation practice of Sesamum
27. Oilseeds – Organic system in sesamum
28. Oilseeds - Cultivation practice of Coconut
29. Oilseeds – Organic system in coconut
30. Oilseeds - Cultivation practice of Sunflower
31. Oilseeds – Organic system in Sunflower
32. Commercial – Cultivation practices of Cotton an Sugarcane
33.Commercial- Organic system in Cotton and Sugarcane
34. Commercial – Cultivation practices of Jute and Tobacco
35. Commercial- Organic system in Jute and Tobacco
36. END SEMESTER EXAMINATION

ORGANIC FARMING PRACTICES FOR FIELD CROPS – PRACTICAL

Identification and collection of various local varieties of seeds of various field crops - Nursery bed preparation for various crops - Main field preparation for various field crops - Seed treatment and different methods of sowing of field Crops - Calculating the growth and the yield components of major Field Crops - Application of manures and composts by different methods.

Practical Schedule:

1. Preparation of various types of organic manures
2. Identification and collection of seeds of various cereal and millets crops
3. Identification and collections of seeds of Various pulses and oilseeds crop
4. Different types of Nursery bed preparation
5. Main field preparation for various field crops
6. Seed treatment methods for field crops
7. Different types of seed sowing methods

8. Working out the seed rate and fertilizer requirements

9. Vermicomposting and its components

10. Calculation of seed rate and fertilizer requirements

11. Different irrigation methods

12. Field visit

12. Field visit

14. Final practical examination

SEMESTER III

ORGANIC FARMING PRACTICES FOR HORTICULTURAL CROPS – 2 CREDITS

Organic method of cultivation with reference to economic importance, soil and climatic requirement,- systems of cultivation, crop management- season, varieties, seed rate, seed treatment, sowing, spacing, nutrient and weed management, irrigation, after cultivation and harvesting technology.

Unit I : **Fruit crops** : Mango, Banana, Citrus, Sapota, Grapes, Guava, Papaya, Pineapple and Pomegranate

Unit II : **Vegetable crops**: Solanaceous vegetables, Root crops, Bulb crops, Cole crops, Cucurbitaceous and Malvaceous vegetables.

Unit III : **Flower crops**: Rose, Jasmine, Marigold, Chrysanthemum, Tuberose and Crossandra

Unit IV : **Spices and Condiments**: Pepper, Cardamom, Ginger, Turmeric, Coriander and Cumin

Unit V : **Medicinal and Aromatic Plants**: Aloe vera, Aswangandha, Glory lily, Periwinkle, Sarpagandha, Senna, coleus, dioscorea sp, ocimum sp, cymbopogon sp

Theory schedule:

1. Organic farming practices for Mango -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
2. Organic farming practices for Banana-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
3. Organic farming practices for Citrus -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
4. Organic farming practices for Sapota -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
5. Organic farming practices for Grapes -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.

6. Organic farming practices for Guava -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
7. Organic farming practices for Papaya -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
8. Organic farming practices for Pineapple -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
9. Organic farming practices for Pomegranate -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
10. Organic farming practices for Solanaceous vegetables-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
11. Organic farming practices for Root crops-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
12. Organic farming practices for Bulb crops -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
13. Organic farming practices for Cole crops-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
14. Organic farming practices for Cole crops-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
15. Organic farming practices for Cucurbitaceous-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
16. Organic farming practices for Cucurbitaceous-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
17. Organic farming practices for Malvaceous vegetables -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
18. Organic farming practices for Rose -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
19. Organic farming practices for Jasmine -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
20. Organic farming practices for Marigold-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.

21. Organic farming practices for Chrysanthemum -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
22. Organic farming practices for Tuberose-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
23. Organic farming practices for Crossandra -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
24. Organic farming practices for Pepper -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
25. Organic farming practices for Cardamom-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
26. Organic farming practices for Ginger -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
27. Organic farming practices for Turmeric- Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
28. Organic farming practices for Coriander -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
29. Organic farming practices for Cumin-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
30. Organic farming practices for Aloe vera -Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
31. Organic farming practices for Aswangandha-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
32. Organic farming practices for Glory lily and Periwinkle-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
33. Organic farming practices for Sarpagandha and Senna-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
34. Organic farming practices for coleus and dioscorea sp-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
35. Organic farming practices for ocimum sp and cymbopogon sp-Organic method of cultivation, crop management, nutrient and weed management, harvest and yield.
36. FINAL EXAMINATION

ORGANIC FARMING PRACTICES FOR HORTICULTURAL CROPS – PRACTICAL

Identification and collection of various local varieties of seeds of various horticultural crops - Nursery bed preparation for various horticultural crops - Main field preparation for various horticultural crops - Seed treatment and different methods of sowing of Horticultural Crops - Calculating the growth and the yield components of major Horticultural Crops - Application of manures and composts by different methods.

Practical schedule:

1. Identification and collection of various local varieties of seeds of fruits and vegetable crops
2. Identification and collection of various local varieties of seeds of flower crops
3. Identification and collection of various local varieties of seeds of spices and contiments
4. Identification and collection of various local varieties of seeds of medicinal and aromatic crops
5. Nursery bed preparation for fruits
6. Nursery bed preparation for vegetables
7. Nursery bed preparation for flower crops
8. Nursery bed preparation for medicinal and aromatic crops
9. Main field preparation for various horticultural crops
10. Seed treatment techniques for Horticultural Crops
11. Different methods of sowing of Horticultural Crops
12. Calculating the growth and the yield components of major Horticultural Crops
13. Application of manures and composts by different methods
14. Final Practical Examination

SEMESTER III

ORGANIC PLANT PROTECTION FOR FIELD AND HORTICULTURAL CROPS – 2 CREDITS

Unit I : **Introduction :** Principles – Prevention, exclusion and eradication of pathogens and pests- Methods of plant protection - Cultural methods and Mechanical methods

Unit II : **Bio agents:** Predators – Parasitoids - Microbial Agents/ other beneficial insects.

Unit III : **Bio pesticides:** Use of botanicals and applications - herbal extracts- liquid extracts for pest and disease control

Unit IV : **Weed management:** Preventive practices- Cultural methods- mechanical control- biological control of weeds for field and horticultural crops

Unit V : . **Plant protection:** Pest and disease management packages of important crops- cereals, millets, pulses, oilseeds, commercial crops, vegetable and fruits crops

Theory schedule

1-3. Introduction **:** Principles – Prevention, exclusion and eradication of pathogens and pests

4-5. Methods of plant protection - Cultural methods

6-7. Mechanical methods

8-9. Bio agents: Predators

10-12- Parasitoids

13-15. Microbial Agents/ other beneficial insects.

16-18. Bio pesticides: Use of botanicals and applications

19-20. Herbal extracts

21-22. Liquid extracts for pest and disease control

23-25. Weed management: Preventive practices- Cultural methods

26-27. Mechanical control

28-29. Biological control of weeds for field and horticultural crops

30. Plant protection: Pest and disease management packages of important crops- cereals

31. Pest and disease management packages of millets

32. Pest and disease management packages of pulses

33. Pest and disease management packages of oilseeds

34. Pest and disease management packages of commercial crops

35. Pest and disease management packages of vegetable

36. Pest and disease management packages of fruits crops

INTEGRATED PLANT PROTECTION FOR FIELD AND HORTICULTURAL CROPS PRACTICAL - 3 CREDITS

Methods of pest control -Preparation of various botanical pesticides-Identification of predators ,parasitoids and pathogens-Different management methods for pest of cereals, pulses, oil seeds, commercial crops, vegetable crops, fruit crops- Different management methods for diseases of cereals, pulses, oil seeds, commercial crops, vegetable crops, fruit crops- Identification of weeds -Biological control of weeds.

Practical schedule

1. Methods of pest control
2. Preparation of various botanical pesticides
3. Identification of predators, parasitoids and pathogens
4. Different management methods for pest of cereals and pulses
5. Different management methods for pest of oil seeds and commercial crops
6. Different management methods for pest of vegetable crops
7. Different management methods for pest of fruit crops
8. Different management methods for diseases of cereals and pulses
9. Different management methods for diseases of oil seeds and commercial crops
10. Different management methods for diseases of vegetable crops
11. Different management methods for diseases of fruit crops
12. Identification of weeds
13. Biological control of weeds
14. ESE Practical Examination

SEMESTER III

FIELD TRAINING – 6 CREDITS

Field training with organic farmers, agro- industries and NGOs for a period of 15 days. The students should collect the data relevant to the courses taught during previous semester (I and II). The details of practicals learnt by the students in field training to be documented, presented and submitted for evaluation.

The split-up details for evaluation of field training is given below.

Evaluation Pattern

Components	**Organic farmers (5 days)**	**Agro Industry (5 days)**	**NGO (5 days)**	**Total (15 days)**
Participation and Documentation (Marks)	20	20	20	60
Record (Marks)				20
Oral Presentation (Marks)				20
Total				**100**

SEMESTER III

PARTICIPATORY HANDS ON TRAINING

Biofertilizer production, Biopesticides production, Water harvesting techniques

SEMESTER IV

18OAEV0429 MARKETING AND SUPPLY CHAIN MANAGEMENT – 3 CREDITS

Unit I : **Economics and Marketing:** Basic production principles - Economic viability of a farm- Cost of production. Benefit/ Cost Ratio. Marketing - Imports and Exports - Crops with market potential

Unit II : Policies and incentives of organic production – Financing-formal, informal and micro credit, government grants and subsidies.

Unit III : **Marketing Management:** Concept - Planning for Marketing - Target Marketing and Competitive Strategy - Mobile Marketing. Organization of supply chain.

Unit IV : Roles and responsibilities of farmers- farmer organizations, buyers and support organizations.

Unit V : Transportation, logistics and infrastructure- Factors influencing success or failure of supply chains.

18OAEV0430 MARKETING AND SUPPLY CHAIN MANAGEMENT- PRACTICAL- 3 CREDITS

Record maintenance – Cost of Production – Cost benefit Ration - Business plan preparation – Identification and Business Opportunities -Market Potential Assessment for Agro-inputs and Agro Products - Product Pricing Methods -Presentation and Discussion on Consumer Survey Reports - Management of Small Agro -Processing Firm – Visit to Firms - Discussion with Lead Bank on Agribusiness Finance -Documents preparation to obtain Agriculture Loan from Banks.

SEMESTER IV

18OAEV0431 PROCESSING OF ORGANIC AGRICULTURAL PRODUCES – 3 CREDITS

Unit I Processing and value addition of Cereals:

Unit II Processing and value addition of Millets:

Unit III Processing and value addition of Pulses:

Unit IV Processing and value addition of Oilseeds;

Unit V Processing and value addition of Commercial crops

18OAEV0432 PROCESSING OF ORGANIC AGRICULTURAL PRODUCES – PRACTICAL- 3 CREDITS

Morphological characteristics of cereals; Physical properties of cereals; Chemical properties of cereals; Parboiling of paddy; Cooking quality of rice; Milling of rice; Conditioning and milling Production of sorghum flakes; Production of popcorns, flaked rice, puffed rice, noodles; Preparation of sorghum malt; Processing of value added products from millets; Visit to Cereal processing unit. Study of mini dhal mill; Study of mini oil mill; Preconditioning of pulses before milling; Preconditioning of oilseeds before milling; Laboratory milling of selected pulses and its quality evaluation; Laboratory milling of selected oilseeds and its quality evaluation; Study of cooking quality of dhal; Processing of composite legume mix and preparation of value added products; Visit to commercial dhal mills and oil mills.

SEMESTER IV

18OAEV0433 PROCESSING OF ORGANIC HORTICULTURAL PRODUCES – 3 CREDITS

Unit I **Introduction**: Production and processing scenario of fruits and vegetables in India and world; Scope of fruit and vegetable processing industry in India; Overview of principles and preservation methods of fruits and vegetables; Supply chain of fresh fruits and vegetables

Unit II **Primary processing** and pack house handling of fruits and vegetables; Peeling, slicing, cubing, cutting and other size reduction operations for fruits and vegetables; Minimal processing of fruits and vegetables; Blanching operations and equipment;

Unit III **Canning:** Definition, processing steps, and equipment, cans and containers, quality assurance and defects in canned products.

Unit IV **Preparation preservation and machines** for manufacture of juices, squashes, syrups, sherbets, nectars, cordials, crystallized fruits and preserves, jam, jelly and marmalades, candies, chutney, pickles, sauce, puree, paste, ketchup; toffee, cheese, wafers and papads, soup powders; Production of pectin

Unit V **Packaging and storage**: fruits and vegetables and their products..

18OAEV0434 PROCESSING OF ORGANIC HORTICULTURAL PRODUCES – PRACTICAL – 3 CREDITS

Extraction and preservation of pulps and juices. Preparation of jam, jelly, RTS, nectar, squash, osmotically dried products, fruit bar and candy and tomato products, canned products. Applications of different types of packaging, containers for shelf life extension. Effect of temperature on shelf life and quality of produce. Demonstration of chilling and freezing injury in

vegetables and fruits. Quality evaluation of products -- physico-chemical and sensory. Visit to processing unit/ industry.

SEMESTER IV

18OAEV0435 ORGANIC LIVESTOCK AND POULTRY PRODUCTION – 3 CREDITS

Unit I **Introduction to Organic Livestock Production:** Definition - Aims of organic farming – benefits of organic livestock - Organic Livestock production Vs Conventional livestock production - Characteristic of Organic Livestock farming - Conversion to Organic livestock farming – Principles of Organic Livestock production - Characterstics of an ideal organic livestock farm - Animal Welfare & Organic Agriculture- Problems in development of organic animal husbandry, Threats to development of organic animal husbandry, Opportunities for India - Landless Organic Animal Husbandry

Unit II **Feeding and other management practices in organic livestock systems** The general principle of livestock feeding in organic systems – cattle feeding – feeding of sheep and goats – pig feeding – poultry feeding – source of feed - Feed supplements – pasture management - – species specific organic management practices – management practices specific to cattle, sheep & goat, pig and poultry

Unit III **Health management in organic livestock systems:** Basics factors to be considered in preventive health strategies –principles of disease control – vaccination - Basic principles of herd health management - Homeopathic Health Management on Organic farm – prevention of health problems and alternative treatment – control of internal parasites – integrated parasite management - animal health plans on organic farms

Unit IV **Certification:** Record keeping - Steps required for certification - National Standards for Organic Livestock Production in India – Landscape -

Fertilization Policy - Animal husbandry management - Length of conversion period – Brought-in Animals - Breeds and Breeding – Mutilations - Animal Nutrition - Veterinary Medicine - Transport and Slaughter - List of Inspection and Certification Agencies of India - List of approved Feed materials for Animal Nutrition - List of approved ingredients for Food Processing - Products authorized for livestock buildings and installation.

Unit V **Conservation of Indigenous breeds and breeding strategies:** Merits of indigenous livestock breeds – Distribution of indigenous breeds – the need and reasons for conservation - *in situ* and *ex situ* conservation – criteria for selecting breeds for conservation - breeding policy – breeders organization - Gaushala for in situ Conservation of Indigenous Cattle Breeds.

18OAEV0436 ORGANIC LIVESTOCK AND POULTRY PRODUCTION – PRACTICAL - 3 CREDITS

Familiarizing with indigenous cattle, buffalo, sheep, goat and chicken breeds – Housing for organic milk production - Formulation of organic feeds for different class of animals – formulation of feeds for different types of chicken - herbal feed additives – ethno veterinary practices for common ailments – hands on training on vaccination, deworming and dipping.

18OAEV0437 PARTICIPATORY HANDS ON TRAINING – 6 CREDITS

The students will be placed in three different agricultural enterprises in groups and they will be exposed to that particular enterprise and allowed to practice themselves from seed to seed. The produce obtained out of this learning experience will be marketed by themselves and the profit will be shared among them.

Hands on training on: Value addition of medicinal plants, Value addition of horticulture crops, Production of Dairy products

SEMESTER V

COMPUTER TALLY – 4 CREDITS

Unit I **:** Book Keeping – Account - Double –Entry System of Book Keeping- journal entry- contra entry- Journal Voucher- word Liability- word assets- Books of Accounts- Indirect Expenditure / Indirect Income- Direct Expenditure / Direct Income- debit- credit- Golden rules of Accounting- Accounting Software- Tally to maintain Account- manual Accounting.

Unit II **:** Creation of Company- Alt the company- Creation of password/ security- Creating ledger account- Altering individual ledger account- Viewing / Altering multiple ledger on screen- Inventory creation / Altering stock group /stock items.

Unit III **:** Entering Voucher- Payment voucher / Receipt Voucher / Contra voucher / Journal voucher- Purchase voucher / Sales voucher / Purchase return / Sales Return- Purchase Order / Sales order / Stock Journal voucher / physical- Stock voucher / Rejection out voucher /

Rejection In voucher.

Unit IV : Easy Access to the various Books of Account- Cash Book / Bank Book / Purchase Book / sales Book /- Journal voucher book / Debit Note book / Credit Note Book- Day Book / Ledger Book.

Unit V : Automatic Creation of Financial Accounting Statement- Trial Balance- Trading A/c- Profit & Loss A/c- Balance Sheet- Stock Summary- Ratio Analysis - Printing various Book of Account- Printing all Financial Statement.

SEMESTER V

18OAEV0538 INSTITUTIONS AND ORGANISATIONS FOR ORGANIC GROWERS – 2 CREDITS

Unit I : Various institutions and organisations involved in organic farming sector- international and national levels- principles- vision- scope and importance- activities. **International organization: IFOAM** – principles- adoption of organic practices- solutions- participatory approaches- global organic network.

Unit II : **BIOFACH:** India's largest organic trade fair for organic products - products provides the perfect business platform to organic stakeholders, retailers, exporters / importers, Govt. boards, state pavilions, certification bodies, consultants and associations from India and all over the world.**USDA/NOP** - regulations and organic standards for export qualities for USA- quality grading.

Unit III : **National Organization: APEDA** - stakeholders for facilitating process certification for export of organic products from India which comply with the NPOP or NOP standards- certification bodies –organic products testing by laboratories. **NABARD** – functions- subsidies schemes for organic farming.

Unit IV : **NCOF-PGS:** India - objectives- trainings- regional centres –activities in India.

OFAI- association to promote organic farming community- mission and goals- resources.

Unit V : **State Level Institutions: TNAU**(Department of sustainable agriculture organic farming research institute) – functions- schemes- trainings.**TNOCD-**activities- standards- certification-trainingfor registered operators.**Vanagam**–nonprofit organization- importance of organic and traditional farming and women empowerment.**CIKS-**organic agriculture- biodiversity conservation- vrkshayurveda.**Biodynamic association of India**- basics of biodynamic farming system- **SOFA-**organic farmers association.

SEMESTER V

18OAEV0539 ORGANIC STANDARDS AND CERTIFICATION – 3 CREDITS

Unit I : **Organic Certification**: Organic Certification –Need for Certification - Certification around the World – Regulatory mechanism in India.

Unit II : **National Standards for Organic Certification**: Agricultural and Processed food products Export Development Authority (APEDA) - National Programme for organic production (NPOP) - operational structure of NPOP–National Standards for Organic production (NSOP) - Accredited Certification bodies(TamilNadu Organic Certification Department in Tamil Nadu).

Unit III : **Organic Crop Production:** Crop production plan **–** conversion requirements – Duration of conversion period – Landscape – Choice of crops –Diversity in crop production and management – Soil and water conservation – Contamination control -Products for fertilizing – Animal husbandry- record keeping system – Permitted and restricted inputs for fertilizing, soil conditioning and for pest and disease control – residue testing - Non compliances and Sanctions.

Unit IV : **Inspection and Certification of Grower Groups**: Procedure for Constitution of Internal Control System – ICS manager –Registration of members – training

of ICS Personnel -Internal inspections -Risk assessment - Internal approval –- External inspection by accredited certification bodies.

Unit V : Organic food processing and handling: Organic requirements – Pest control – Ingredients – Processing methods- packaging and labeling – Storage and transport. Organic certification mark - Organic logo - specifications - concept of organic logo - regulations for grant of license to use - certification mark for organic products.PGS (Participatory Guarantee System) - An overview of the PGS system in India – advantages and disadvantages.

18OAEV0540 ORGANIC STANDARDS AND CERTIFICATION – PRACTICAL – 3 CREDITS

Study of important records in the farm and their maintenance- Product labeling-Visit to certified farms-Visit to organic food processing unit- Visit and study of grower group-Preparation of report for organic inspection and certification- Internal Control System (ICS) training-Visit to Tamil Nadu organic certification department

SEMESTER V

18OAEV0541 FOOD SAFETY AND QUALITY STANDARDS – 4 CREDITS

Unit I : **Food safety:** Definition – responsibilities- traditional problems – emerging pathogens. Introduction to Risk Analysis, Risk Management, Risk Assessment, Risk Communication.

Unit II : **Quality Management system –** definition – terminology - Principles of quality management systems – benefits of quality management systems.

Unit III : **Food laws:** Food standards – Food legislation – general food laws – main objectives of food law – general principles of food law- main features and functions. Integrated food law- JIVIK Bharath logo ACT

Unit IV : **Regulatory systems/agencies-** Safety standards for cereals, millets, pulses, oil seeds and commercial crops

Unit V : **Regulatory systems/agencies-** Fruits, vegetables, spices and processed produces

SEMESTER V

18OAEV0542 FIELD TRAINING – 6 CREDITS

Field training with organic farmers, agro- industries and NGOs for a period of 15 days. The students should collect the data relevant to the courses taught during previous semester (I and II). The details of practicals learnt by the students in field training to be documented, presented and submitted for evaluation.

The split-up details for evaluation of field training is given below.

Evaluation Pattern

Components	Organic farmers (5 days)	Agro Industry (5 days)	NGO (5 days)	Total (15 days)
Participation and Documentation (Marks)	20	20	20	60
Record (Marks)				20
Oral Presentation (Marks)				20
Total				**100**

18OAEV0543 EDUCATIONAL TOUR – 2 CREDITS

The students will be taken on educational tour in National and International institutions related to organic farming, Agro processing industries, supply chain stores and allied areas in various regions. The students will gain firsthand knowledge about different agro climatic zones, crops cultivated, cultivation practices, processing aspects, socio-cultural and economic status of organic growers in different areas. The duration of the tour would be 7 days (Institutional visits and intermediary journey) exclusive of onward and return journeys. Students will maintain a tour diary to record their observation at the places of visit. A tour record has to be submitted after the tour. The evaluation procedure will be as follows.

Evaluation procedure

Written test – 50 marks

Attendance and Behaviour – 20 marks

Record and pocket notebook- 20 marks

Viva-voce- 10 marks

Total = 100 marks

18OAEV0544 PARTICIPATORY HANDS ON TRAINING – 6 CREDITS

The students will be placed in three different agricultural enterprises in groups and they will be exposed to that particular enterprise and allowed to practice themselves from seed to seed. The produce obtained out of this learning experience will be marketed by themselves and the profit will be shared among them.

Hands on Training on: Jaggery production, Sericulture, Apiculture.

SEMESTER VI

18OAEV0645 ENTREPRENEUR SKILLS, AGRIBUSINESS AND PROJECT MANAGEMENT – 3 CREDITS

Unit I : **Entrepreneur:** Concepts and Functions of Entrepreneur, Characteristics of entrepreneurs, Entrepreneurship Development; SWOT Analysis & achievement motivation, Government policy and programs and institutions for entrepreneurship development. Women Entrepreneurship – concept problems and development of women entrepreneurs

Unit II : **Agribusiness/ Agri. enterprises:** Impact of economic reforms on Agribusiness/ Agri.-enterprises, Entrepreneurial Development Process; Business Leadership Skills.

Unit III : **Leadership and Managerial Skill:** Developing organizational skill (controlling, supervising, problem solving, monitoring & evaluation), Developing Managerial skills, Business Leadership Skills

(Communication, direction and motivation Skills) Problem solving skill.

Unit IV : **Finance and Agri.- entrepreneurship**: Financing of enterprise, Opportunities for agri.-entrepreneurship and rural enterprise, Venture Capital – Concept, Aims, Features, Financing steps sources, Criteria to provide Venture Capital Finance, Export and Import Relevant to Agriculture Sector.

Unit V : **Project Planning Formulation:** Project Planning Formulation and report preparation.

SEMESTER - VI

18OAEV0646 ENTREPRENEUR SKILLS, AGRIBUSINESS AND PROJECT MANAGEMENT – PRACTICAL- 3 CREDITS

Assessing entrepreneurial traits, problem solving skills, managerial skills and achievement motivation, exercise in creativity, time audit through planning, monitoring and supervision, identification and selection of business idea, preparation of business plan and proposal writing, visit to entrepreneurship development institute and entrepreneurs.

SEMESTER - VI

18OAEV0647 QUALITY CONTROL OF AGRICULTURAL INPUTS – 3 CREDITS

Unit I	**Quality control:** Need- Agencies- Organic Inputs approved - Fertilizer control order
Unit II	**Manures/ compost:** Composition of manure- bulk and concentrates- dung, urine**,** oil cakes**,** nutrient content- organic matter, mineral matter, compost quality parameters, testing compost maturity
Unit III	**Biofertilizers:** Sampling, growth, purity and staining of mother cultures, pH, gram staining, total cell count, total viable cell count, gram staining, optical density of broth, pH, viable number and moisture teat of carrier material, shelf life of biofertilizers
Unit IV	**Bio nutrient solutions**: Composition, nutrient content, microbial load,

growth regulators in nutrient solutions like panchagavya

Unit V **Bio control agents**: Quality parameters like CFU, Pathogenic contamination etc., Bio agents- registration.

18OAEV0648 QUALITY CONTROL OF AGRICULTURAL INPUTS – PRACTICAL – 3 CREDITS

Nutrient content of manures, compost quality parameters, compost maturity, Quality parameters of bio nutrient solutions like panchagavya, sampling, determination of pH, viable count, gram staining of biofertilizers, study of quality parameters in biocontrol agents.

SEMESTER VI

18OAEV0649 ITKs IN ORGANIC FARMING– 3 CREDITS

Unit I **Introduction:** Indigenous Knowledge – meaning and definition. Indigenous Vs Western knowledge – criteria for ITK. Fields and types of 1K, Nature, Scope and Characteristic features of ITK, need and importance of 1K systems, limitations of 1K -1Ks for sustainable agriculture.

Unit II **Collection and Documentation of 1TK:** Need for collection and documentation of 1TK – Sources of 1TK, Primary and Secondary sources – drawing a sample – identifying the indigenous specialists – procedures to be followed in recording 1K. Forms of documenting 1TK – Methods of collecting 1TK – case studies, field observation, interviews, participant observation, participatory technology analysis, surveys, brain storming, group discussion, role play, village workshop, transect – records, audio and video documentation.

Unit III **1TKs on Cultivation of Field Crops:-** Indigenous Knowledge / Practices on the cultivation of field crops such as cereals, millets, pulses, oilseeds and sugar crops and on general agriculture.

Unit IV **1TKs on Cultivation of Horticultural Crops:** Indigenous Knowledge /

Practices on the cultivation of Horticultural crops such as Vegetables, fruits, flowers, beverages, spices and plantation crops.

Unit V **EVPs on Livestock Management:** Livestock Health Systems, Digestive, circulative, nervous, excretory, respiratory and dermal systems. Common disorders and ailments commonly practiced EVPs for treatment

18OAEV0650 ITKs IN ORGANIC FARMING – PRACTICAL- 3 CREDITS

Identification of sources for collection of 1Ks, Practicing different methods of collecting 1Ks, Documentation of 1Ks on Field crops, Documentation of 1Ks on horticultural crops, Documentation of 1Ks on general agriculture and storage practices, Documentation of EVPs on livestock management.

18OAEV0651 PROJECT WORK – 6 CREDITS

Introduction to thrust areas of research – Identification of research problem – Review of literature – Research methodology – Conduct of study – Data collection – Analysis and interpretation of data – Preparation of research report and submission.

References

1. Kothari, C.R. 1997. Research Methodology, Wishawa Prakasam, New Delhi.
2. Rangaswamy, R. 1995. A Hand Book of Agriculture Statistics, Wiley Eastern Ltd., New Delhi.
3. Robert A.D.2001. How to write and publish scientific paper, Cambridge University Press, Cambridge.

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The students will be placed in three different agricultural enterprises in groups and they will be exposed to that particular enterprise and allowed to practice themselves from seed to seed. The produce obtained out of this learning experience will be marketed by themselves and the profit will be shared among them.

Hands on Training on: Mushroom production, Poultry Farming, value addition of Agro products.