B.Voc. (ORGANIC AGRICULTURE and ENTERPRISE DEVELOPMENT)

Syllabus

(With effect from April 2022)

Deen Dayal Updhayay – Kaushal Kendra
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
21ENGV0101	GEC	Foundational English- I	3	40	60	100
21YOGU0001	GEC	Yoga Education	1	50	-	50
22OAEV0101	GEC	Basics of Livestock and Poultry Management	4	40	60	100
22OAEV0102	GEC	Basics of Livestock and Poultry Management – Practical	4	60	40	100
		Total	**12**			**350**
22OAEV0103	SDC	Principles of Agronomy	2	20	30	50
22OAEV0104	SDC	Principles of Agronomy – Practical	2	30	20	50
22OAEV0105	SDC	Fundamentals of Organic Farming	2	20	30	50
22OAEV0106	SDC	Fundamentals of Organic Farming – Practical	2	30	20	50
22OAEV0107	SDC	Principles and Practices of Biodynamic Agriculture	2	20	30	50
22OAEV0108	SDC	Principles and Practices of Biodynamic Agriculture – Practical	2	30	20	50
22OAEV0109	SDC	Experiential Learning I- Preparation of Organic manures and Bio-nutrient solution	6	60	40	100
		Total	**18**			**400**
		Grand Total	**30**			**750**

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SCHEME OF EVALUATION

II SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
21ENGV0202	GEC	Foundational English- II	3	40	60	100
21CSAV02T1	GEC	Digital Marketing	(0+3)	60	40	100
21SPOU0001/ 19FATU001	GEC	Sports and Games/ Fine Arts	1	50	-	50
22OAEV0210	GEC	Basics of Seed Production	3	40	60	100
22OAEV0211	GEC	Basics of Seed Production- Practical	2	30	20	50
		Total	**12**			**400**
22OAEV0212	SDC	Sustainable Agriculture and Farming systems	2	20	30	50
22OAEV0213	SDC	Sustainable Agriculture and Farming systems - Practical	2	30	20	50
22OAEV0214	SDC	Water and Irrigation Management	2	20	30	50
22OAEV0215	SDC	Water and Irrigation Management- Practical	2	30	20	50
22OAEV0216	SDC	Soil Health and Nutrient Management	2	20	30	50
22OAEV0217	SDC	Soil Health and Nutrient Management- Practical	2	30	20	50
22OAEV0218	SDC	Experiential Learning – II - Biofertilizer and Composting Technology	6	60	40	100
		Total	**18**			**400**
		Grand Total	**30**			**800**

III SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
22OAEV0319	GEC	Environmental Studies and Disaster Management	2	20	30	50
22OAEV0320	GEC	Environmental Studies and Disaster Management – Practical	2	30	20	50
21NSSU0001/ 21SSCU0001	GEC	NSS/Shanthi sena	1	50	-	50
22OAEV0321	GEC	Fundamentals of Agricultural Marketing	3	40	60	100
22OAEV0322	GEC	Fundamentals of Agricultural Marketing- Practical	2	30	20	50
22OAEV0323	GEC	Organic Production of Field crops	2	20	30	50
		Total	**12**			**350**
22OAEV0324	SDC	Organic Production of Horticultural crops	2	20	30	50
22OAEV0325	SDC	Organic Plant Protection for Field and Horticultural Crops	3	40	60	100
22OAEV0326	SDC	Organic Plant Protection for Field and Horticultural Crops – Practical	3	60	40	100
22OAEV0327	SDC	Field Placement Training	4	60	40	100
22OAEV0328	SDC	Experiential Learning -III- Biorepellents and Biocontrol agents	6	60	40	100
		Total	**18**			**450**
		Grand Total	**30**			**800**

B.Voc (ORGANIC AGRICULTURE AND ENTERPRISE DEVELOPMENT)

SCHEME OF EVALUATION

IV SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
21CSAV04T1	GEC	Web Designing	(0+3)	60	40	100
22OAEV0429	GEC	Principles of Forestry and Sericulture	2	20	30	50
22OAEV0430	GEC	Principles of Forestry and Sericulture – Practical	2	30	20	50
22OAEV0431	GEC	Institutions and Organizations for Organic Growers	3	40	60	100
22OAEV0432	GEC	Institutions and Organizations for Organic Growers– Practical	2	30	20	50
		Total	**12**			**250**
22OAEV0433	SDC	Processing of Organic Agricultural Produces	3	40	60	100
22OAEV0434	SDC	Processing of Organic Agricultural Produces – Practical	3	60	40	100
22OAEV0435	SDC	Processing of Organic Horticultural Produces	3	40	60	100
22OAEV0436	SDC	Processing of Organic Horticultural Produces – Practical	3	60	40	100
22OAEV0437	SDC	Experiential Learning -IV- Mushroom Cultivation	6	60	40	100
		Total	**18**			**500**
		Grand Total	**30**			**750**

V SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
22OAEV0538	GEC	Farm Power and Machinery	3	40	60	100
22OAEV0539	GEC	Farm Power and Machinery-Practical	3	60	40	100
22OAEV0540	GEC	Entrepreneurship development and Business Management	3	40	60	100
22OAEV0541	GEC	Entrepreneurship development and Business Management-Practical	3	60	40	100
		Total	**12**			**400**
22OAEV0542	SDC	Organic Livestock and Poultry Production	3	40	60	100
22OAEV0543	SDC	Organic Livestock and Poultry Production- Practical	3	60	40	100
22OAEV0544	SDC	Organic Norms	2	20	30	50
22OAEV0545	SDC	Food safety and Quality Standards	2	20	30	50
22OAEV0546	SDC	Educational Tour	2	-	-	50
22OAEV0547	SDC	Experiential Learning - V Nursery Management technologies	6	60	40	100
		Total	**18**			**450**
		Grand Total	**30**			**850**

VI SEMESTER

Course Code	Category	Course Title	Credits	Marks		
				Mid semester	ESE	Total
22OAEV0648	GEC	Operational Guidelines for Documentation	4	40	60	100
22OAEV0649	GEC	Farm Inspection and Certification Procedure	4	40	60	100
22OAEV0650	GEC	ITKs in Organic Farming	2	20	30	50
22OAEV0651	GEC	ITKs in Organic Farming – Practical	2	30	20	50
		Total	**12**			**300**
22OAEV0652	SDC	Inspection and Certification of Organic Produces- Practical	2	30	20	50
22OAEV0653	SDC	Project work	6	60	40	100
22OAEV0654	SDC	Field Placement Training	4	60	40	100
22OAEV0655	SDC	Experiential Learning -VI Apiculture Technology	6	60	40	100
		Total	**18**			**350**
		Grand Total	**30**			**650**

SEMESTER I

21ENGV0101 FOUNDATIONAL ENGLISH -I (3 CREDITS)

OBJECTIVES

- To help the students understand the intricacies of english grammar for everyday use.
- To help them improve their essential language skills in English.

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:** Nouns and Pronouns, Adjectives and Determiners, Verbs and Tenses, Auxiliary Verbs

Unit II : **Listening:** Descriptions, Story Narrations, Short Speeches

Unit III : **Reading and Vocabulary:** Reading comprehension passages, Vocabulary building

Unit IV : **Speaking Skills:** Face to Face Conversation, Descriptions, Telephone Conversation

Unit V : **Writing Skills:** Paragraph writing, Note making, Short Narrative Essays

TEXTBOOKS

Foundational English I Textbook/Course Material - Prepared by the school.

REFERENCE BOOK

Sargeant and Howard. *Basic English Grammar Book 2*. Irvine: Saddleback, 2007. Print.

SEMESTER I

21YOGU0001-YOGA EDUCATION (1 CREDIT)

OBJECTIVES

- The course aims to gain the practical knowledge about Yogic Practices.

LEARNING OUTCOME

Students should be able to

1. Understand concept of yoga.
2. Demonstrate the suryanamaskar and various asanas.
3. Perform meditation techniques.
4. Realize the benefits of mudras and bandhas
5. Assess the difference between the asanas and physical exercises.

THEORY

		CONTENT	**No. of Hours**
Unit I	:	**History of Yoga** - Definition – Aims and Objectives - Yoga as an ideal system of physical culture - Difference between practice of Asanas and Physical Exercise.	**2**
Unit II	:	**Schools of Yoga:** Patanjaliyoga – Astangayoga – Tantrayoga – Mantrayoga – Hathayoga – Layayoga - Rajayoga – Jnanayoga – Bhaktiyoga – Karmayoga – Loosening Exercises in yoga – Suryanamaskar.	**4**
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.	**3**
Unit IV	:	**Asanas Practice:** Prone Asanas: Makarasana – Bhujangasana – Shalabhasana – Dhanurasana - Supine Asanas: Pavanamuktasana – Sethubandasana – Navasana –Savasana – Yoga and	**3**

postural deformities - text neck.

Unit V	:	**Pranayama Practice:** Sectional Breathing - Nadisuddhi – Bhramari –Bhastrika - Kapalabhati – Introduction to Bandhas – Mudras –Dharana (Trataka) – Dhyana – Jalaneti -Importance of pranayama practice for Covid19.	**4**

Text Books:

1. Chandrasekaran K, (1999), Sound Health Through Yoga, Prem Kalyan Publications, Sedapatti.
2. Iyengar B.K.S, (2000), Light on Yoga, Harpine Collins Publication, New Delhi, 2000.
3. Nagarathnam H R. & Dr.H R Nagendra (2015) Promotion of positive health swami vivekanandha yoga prakashana, Banglore.
4. Swami Satyananda Saraswati, (2008): Asana Pranayama Mudra, Bandha (IV Revised Edition): Bihar School of Yoga, Munger, India.

REFERENCE BOOK

1. Chandara Shekar K., 2003, Yoga for Health, , Khel Sahitya Kendra, Theni.
2. Indira Devi, 2002, Yoga for You, , Jaico Publishing House, Chennai.
3. Maharishi Patanjali, 2003, Yoga for All, Sahni Publications.
4. Pandit.M.P.1987, Yoga for the Morden Man, Sterling Publishers Private Limited, New Delhi.
5. Swami Kuvalayananda, 1993, Asanas, Kaivalayadhama, Lonavla.
6. Vivekananda Kendra Prakashan, (2009), Yoga, Chennai.
7. Yoga for Health, 2003, Institute of Naturopathy & Yogic Sciences, Bangalore.

Web Resources:

1. https://kdham.com/
2. http://www.biharyoga.net/

SEMESTER I

22OAEV0101 BASICS OF LIVESTOCK AND POULTRY MANAGEMENT (4) 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 : **Cattle:** Introduction-Meaning of commonly used terms- Livestock census- Role of livestock in Indian economy-Milk production and availability. Cattle breeds- Indigenous breeds- Red Sindhi, Sahiwal, Gir, Kangayam- Exotic breeds- Holstein Friesian, Jersey, Brown Swiss. Breeds of buffalo- Murrah- Surti- Nili Ravi- selection of dairy cattle. Female reproductive system- Oestrous cycle- Signs of heat. Care of calf at birth- Heifer management- Management of pregnant animals. Housing – Types of animal housing- Conventional barn – Loose housing- construction details of cattle shed. Classification of feeds – Digestive system of ruminants – Digestion of feed- common ailments- Bloat- Carbohydrate engorgement- Diarrhoea- Indigestion. Common diseases- Mastitis- Foot and mouth disease- Anthrax- Black quarter- Endoparasites- Ectoparasites.

Unit II : **Sheep:** Introduction-Zoological classification- Advantages of sheep farming- breeds classification- Indigenous breeds- Hissardale, Chokla, Nali, Nellore, Mandya- Breeds of Tamilnadu- Mecheri, Madras red, Ramnad White, Trichy black, Kilakarsal, Vembur- Exotic breeds- Merino, Rambouillet, Dorest- Suffolk- South Down- Breeding- Selection of breeding stocks- Reproduction in sheep – Breeding system- Breeding policy for improving mutton and wool production- Feeding- Nutrient requirements- Feed resources- Pasture management- Flushing- Feeding of pregnant and lactating ewes- Housing of sheep- Common diseases-

Sheep pox- Blue tongue- PPR- Anthrax- Hemorrhagic septicemia- Foot rot- Pregnancy toxemia.

Unit III : **Goat:** Introduction- Meaning of commonly used terms- Advantages of goat farming – Breeds- Indigenous breeds- Jamunapuri- Tellicherry – Barbari- Exotic breeds- Saanen- Toggenberg- Nubian- Breeding- Selection of breeding animal- Reproduction- Mating systems- Feeding- Feeding habits of goat- Nutrient requirement- Stall fed system of goat rearing- Control of ecto and endo parasites- Common complaints- Carbohydrate engorgement- HCN poisoning- Tetanus.

Unit IV : **Swine:** Advantages and disadvantages of pig farming – Utility- Breeds- Large White Yorkshire- Middle White Yorkshire- Landrace- Berkshire- Breeding- Selection of breeding stocks- Reproduction-Symptoms of heat- Care of pregnant sows- Management at the time of furrowing- Weaning- Feeding- Creep feeding- Starter ration- Grower ration- Finisher ration- quantity to be feed- Housing of pigs- Common diseases- Swine fever- Swine pox- Foot and mouth disease- Swine erysipelas- Brucellosis.

Unit V : **Poultry:** Advantages of poultry farming- Role of egg and chicken meat in human nutrition- Parts of a fowl – Classification of poultry- American- English- Asiatic- Mediterranean classes- Management- Chick- Grower- Layer- Broiler- Housing- Location- Housing requirements- Construction details- Deep litter system- Cage system- Feeding- Nutrient requirement for different classes of chicken- Feed formulation- Common diseases- Ranikhet disease- Infectious bursal disease- Coccidiosis- Vaccination- Dressing of bird for table purpose.

SEMESTER I

22OAEV0102 BASICS OF LIVESTOCK AND POULTRY MANAGEMENT (4) CREDITS

PRACTICAL SCHEDULE

1. Familiarizing with of body parts of farm animals
2. Identification of breeds of livestock
3. Identification of Disbudding and Castration
4. Identification of Dentition and ageing
5. Recording of temperature, pulse and respiration.
6. Identification of feeds and fodder
7. Preparation of plans for animal housing
8. Preparation of dairy farm projects for obtaining bank loan
9. Preparation of project for a sheep unit
10. Preparation of project for a goat unit
11. Preparation of project for a broiler chicken unit
12. Preparation of project for a layer chicken unit
13. Visit to commercial sheep, goat, piggery, rabbitary and poultry farm.
14. Final Practical Examination

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

22OAEV0103 PRINCIPLES OF AGRONOMY- 2 CREDITS

OBJECTIVES

- To know about the Principles and practices of Crop production and management.

LEARNING OUTCOME

- The students can understand the scope and importance of Agriculture in Indian economy.
- To know about the basic knowledge of crop adaption, distribution, classification and economic importance of various crops including Soils and agricultural seasons
- Basic knowledge about tillage and modern concepts of tillage.
- To know about the cropping and farming system definitions and concepts .
- To know about the characteristics and classification of weed- weed dissemination, principles and methods of weed management and Integrated Weed Management (IWM), Practices

THEORY

Unit I : **Introduction :** Agriculture- Definition, Art, Science and Business of crop production- Scope of Agriculture in India and Tamil Nadu- Importance of Agriculture in Indian economy- Branches of Agriculture- Crop Improvement, Crop management , Crop protection and social sciences- History and Development of scientific Agriculture in World and India- National and International Institutions/ Centres on Agricultural research- Agronomy- Definition- - Relationship with other disciplines- Role of an Agronomist.

Unit II : **Crop adaptation and distribution:** Agronomic classification of crops- Their economic importance- Major crops of India and Tamil Nadu- adaptation and distribution. Factors affecting crop production – Internal (Genetic factors) and External (Environmental) factors affecting crop production. Soils of India and Tamil Nadu - Agriculture seasons of India and Tamil Nadu.

Unit III : **Tillage and Basic field operations:** Principles and practices of Agricultural operations- Tillage and Tilth- Characteristics of good tilth- Objectives of Tillage- Types of tillage – Primary and Secondary tillage and Intercultural operations- Implements and tools various agricultural operations- Preparatory cultivation- After cultivation- Gap filling and Thinning- Modern concepts of Tillage- seeds and sowing- seed treatment- Nursery and Transplanting- Harvesting , threshing , drying and storage

Unit IV : **Cropping systems and Farming systems:** Definition- Systems of farming- Wet land, Garden land and Dry land farming systems- factors affecting choice of crop and varieties- Types of cropping systems- Mono cropping, Multiple cropping, Inter cropping, Mixed cropping, sequential cropping and Multi-tier cropping- Crop

rotation- definition and advantages- Integrated Farming System (IFS)- Definition and Types of IFS- Wet, Garden and Dry land farming system- Organic farming and Precision farming- Definition, concepts and its advantages

Unit V : Weed management: Definition- Classification of weeds- characteristics of weeds- Dissemination of weeds- Harmful and beneficial effects of weeds- Critical period of crop- weed competition- Principles of weed management-Methods of weed management- Cultural (mechanical, cropping and competition), chemical and biological methods- organic weed control methods- Formulations- Mode of action- Time and methods of application- control of invasive weeds- Integrated weed management (IWM) – Definition and practices

SEMESTER I

22OAEV0104 PRINCIPLES OF AGRONOMY- 2 CREDITS

PRACTICAL SCHEDULE

1. Identification of crops in wetland system of farming.
2. Identification of garden land and dry land system of farming.
3. Identification of tillage implements and acquiring skill in tillage operation.
4. Identification of seeds of various field crops.
5. Practicing nursery bed preparation for low land and upland crops.
6. Practicing different methods of sowing and other cultivation practices in field crops.
7. Practicing harvesting and processing of important crops.
8. Practicing of different cropping systems and farming systems.
9. Calculating the growth and the yield components of major crops.
10. Identification of weeds in wet, garden land and dry land areas.
11. Acquiring skill in mechanical and cultural methods of weed control, use of tools and implements.
12. Practicing the methods of application of herbicide for different field crops weeds
13. Practicing the methods of application of herbicide for different perennial, invasive and water weeds .
14. Final Practical Examination.

REFERENCES

1. Gupta, O.P. 1998. Weed management principles and practices, Agro botanical Publishers, Biloaneers.
2. Hosmani, M.M. 1995. Integrated weed management in field crops, Hosmani Publishers, Dharward.
3. Yeliamanda Reddy and G.H.Sankara Reddi, 1998. Principles of Agronomy, Kalyani Publishers, Ludhiana.
4. Sankaran, S.V.T.Subbiah Mudaliar. 1997. Principles of Agronomy, The Bangolre Printing and Publication Company Pvt. Ltd., Bangalore.
5. Rao, V.S.1983. Principles of weed science. Oxford and IBH, New Delhi.
6. Ranganathan, T.T., K.Govindan and T.Senthivel, 2006. Sustainable Agricultural Practices. ETC foundation- COMPAS The Netherlands and Faculty of Agriculture and Animal sciences, December 2006.

SEMESTER I

22OAEV0105 FUNDAMENTALS OF ORGANIC FARMING – 2 CREDITS

OBJECTIVES

- To teach the history, importance, concept and principles of organic farming
- To teach on compost preparation methods and organic certification

LEARNING OUTCOME

- The students can understand the Importance, basics , principles and need of organic farming.
- The students can learn the methods of organic farming, organic nutrients preparation and soil enrichment methods including basics of certification.

THEORY

Unit I : **Introduction:** General status and trend in population and food production, agricultural growth, fertilizer and pesticide consumption (in pre and post green revolution period) and negative impacts of their excess application- Relevance of organic farming- Introduction, consequences of the use of high yielding varieties, characteristics of indigenous varieties, ill effects of green revolution.

Unit II : **Concept of organic farming :** Principles of organic agriculture, IFOAM-Definition-Significance of Indian farming, size of organic food market area under organic farming, status of in India, export of organic food from India, ethics of organic farming, objectives of organic farming, characteristics of organic farming.

Unit III : **Organic production requirements:** Components of organic farming, nutrient management in organic farming, limiting nutrient losses, organic manures, farm yard manures, factors influencing the quality of FYM, enrichment of FYM- Principles of composting- methods of composting - Green manures and Green leaf manures –Vermicompost- Recycling of organic residues-Introduction to biofertilizers.

Unit IV : **Soil improvements and soil amendments:** Saline and alkali soils, saline soil(white alkali), sodic soil(black alkali/ non-saline alkali),saline-alkali land, effects of soil salinity and alkalinity, acid soils, more about saline soils-Organic weed management-Introduction, organic methods of weed management.

Unit V : **Certification standards, process and procedure:** Certification standards , Certification , accreditation, types of certification, Certification standards-group certification, internal control system-(ICS)-Certification agencies-International inspection and certification agencies, organic market, organic food products exported from India, Export of organic food products from India, Advantage in Indian condition

SEMESTER I

22OAEV0106 FUNDAMENTALS OF ORGANIC FARMING – 2 CREDITS

PRACTICAL SCHEDULE

1. Visit to organic farmers field (different categories)
2. Study on various components of organic farming and their utilization
3. Identification of different types of composting methods
4. Preparation of compost and enriched compost
5. Preparation of vermicompost
6. Maturity indices and Quality analysis of compost
7. Identification of biofertilizers and methods of application.
8. Preparation of Bio-fertilizers/ Bio-inoculants
9. Quality analysis of Bio-fertilizers/ Bio-inoculants
10. Indigenous Technical Knowledge (ITK) for nutrients management
11. Indigenous Technical Knowledge (ITK) for pest and disease management
12. Indigenous Technical Knowledge (ITK) for weed management
13. Cost of cultivation in organic production system
14. Post harvest management of organic production system
15. Quality aspect, grading, packaging and handling.
16. Final 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.
5. Ranganathan, T.T., K.Govindan and T.Senthivel, 2006. Sustainable Agricultural Practices. ETC foundation- COMPAS The Netherlands and Faculty of Agriculture and Animal sciences, December 2006.

SEMESTER I

22OAEV0107 PRINCIPLES AND PRACTICES OF BIODYNAMIC AGRICULTURE-2 CREDITS

OBJECTIVES

- To learn about the principles and practices of Biodynamic farming and its importance.

LEARNING OUTCOME

- The students can understand the scope of agriculture and organic farming.
- To know about the basics of biodynamic farming and its practices.
- The students learn about the principles of soil water relationship.
- The students aware about the Bio-dynamics of Agriculture, Soil science and animal husbandry

THEORY

Unit I : **Introduction to Agriculture :** Scope and importance of Agriculture -Global scenario- Green Revolution- Chemicalization of soil- Use of hazardous Pesticides- Climate change- Need for alternative approaches. Organic 1.0, organic 2.0-Types and challenges in different types of farming- Difference between conventional, organic and biodynamic farming- Recent trends in organic farming-Organic technologies and innovations in organic farming- National and International status on organic and Biodynamic Agriculture Applied Research Programmes.

Unit II : **Soil-Plant-Water Relationship:** Components of Soil-Mineral Matter /soil organic carbon/ Organic Matter/ Water/Air- Soil factors that influence plant growth- Controlling Growth Inhibiting salts)- Physical properties of soil in relevance to irrigation- Types of soil and their water holding capacity and water distribution pattern.

Unit III : **Biodynamic Agriculture:** Principles and reasons for bio dynamic farming- Global status on Bio-dynamic farming- Biodynamic properties- Preparation and application- Cosmic influence enhancer and immunizer- Cow pat pit (CPP) BD 500, BD501, BD compost-manure preparation and application- Basic astronomy, Constellations and their classifications- Moon and its different Rhythms – Farming activities and Work planning- Use of planning calendar in Agricultural activities.

Unit IV : **Biodynamic Soil Science:** Concept of soil nutrient management under organic farming- Soil activation and Soil enhancement- Importance of top soil in organic cultivation- Identify various methods of activating microbial activity in top soil- Prepare various inputs that can increase soil microbial activity- crop selection and land preparation- Green manure crop – Farmyard manure, use of compost methods- Implementation of soil enhancement methods- Soil formation and soil analysis- Bio- fertilizers- Nutrient cycles- Vermicompost production- Vermi wash, Vermin tea problems in using New Airmail Measures.

Unit V : Biodynamic Animal husbandry: Converting a farm organic biodynamic and role of animal husbandry in biodynamic farms, Certification and Marketing (DEMETER)- Participatory Guarantee System (PGS)- DEMETER standards and certification procedures- NOP, NPOP.

SEMESTER I
22OAEV0108 PRINCIPLES AND PRACTICES OF BIODYNAMIC AGRICULTURE-2 CREDITS

1. Identification of Biodynamic preparations
2. Identification of bio dynamic farmers
3. Preparation of cow horn manure (Preparation 500)
4. Preparation of cow horn silica (Preparation 501)
5. Preparation of 508- made from the herb horsetail (*Equisetum arvense*)
6. Preparation of fish concentrate mineral tonic manure.
7. Preparation of growth hormone (seaweed concentrate)
8. Preparation of composting in Bio-dynamic way-BD compost.
9. Preparation of Cow Pat Pit and Tree paste
10. Preparation of herbal formulation
11. Preparation of Panchagavya
12. Identification of spraying types and application methods
13. Understanding the planting calendar in Bio-dynamic agriculture.
14. Final 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.
5. Ranganathan, T.T., K.Govindan and T.Senthivel, 2006. Sustainable Agricultural Practices. ETC foundation- COMPAS The Netherlands and Faculty of Agriculture and Animal sciences, December 2006.

SEMESTER I
EXPERIENTIAL LEARNING - I
22OAEV0109 PREPARATION OF ORGANIC MANURES AND BIONUTRIENT SOLUTION– 6 CREDITS

PREPARATION OF ORGANIC MANURES

1. Identification and collection of Bulky organic manures (BOM)
2. Farm Yard Manure (FYM)
3. Sheep and goat manure
4. Poultry manure
5. Municipal waste composting
6. Bangalore method of composting
7. Green manure and Green leaf manure
8. Identification and collection of Concentrated Organic Manures
9. Edible oil cakes- Groundnut cake, Coconut cake
10. Non edible oil cakes - Castor cake, Neem cake, Mahua cake
11. Both edible and non-edible oil cakes- Jatropha oil cakes, Pongamia oil cakes, Cottom seed oil cakes
12. **Animal based concentrated organic manures- Horn and hoof meal, Raw bone meal, Crushed bone meal, Blood meal, Meat meal, Fish meal.**

BIO-STIMULANT SOLUTION PREPARATION

1. Preparation of Panchagavya
2. Preparation of Dasagavya
3. Preparation of Amirthakaraisal
4. Preparation of Jeevamirtham
5. Preparation of Cocomilk or Themor Karaisal
6. Preparation of Arappu Moor Karaisal
7. Preparation of Fish Karaisal
8. Preparation of E.M.Karaisal
9. Preparation of Lemon Egg Karaisal
10. Preparation of Tholluyir Karaisal
11. Preparation of Palakaadi Karaisal
12. Preparation of Neem Oil cake Karaisal
13. Preparation of Claypot Plant Balm (Manpanai sedi thailam)
14. Preparation of Bamboo E.M.Karaisal
15. Final Practical Examination

REFERENCE BOOKS

1. ICAR, 2015. Hand book of Agriculture. Indian council of Agricultural Research, New delhi.
2. Ranganathan, T.T., K.Govindan and T.Senthivel, 2006. Sustainable Agricultural Practices. ETC foundation- COMPAS The Netherlands and Faculty of Agriculture and Animal sciences, December 2006.

SEMESTER II

21ENGV0202 FOUNDATIONAL ENGLISH - II (3 CREDITS)

OBJECTIVES

- To help the students understand the intricacies of english grammar for everyday use.
- To help them improve their essential language skills in English.

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:** Prepositions and Prepositional phrases, Conjunctions, Direct and Indirect speech, Sentences, Punctuation

Unit II : **Listening Skills :** Long Narratives, Recorded speeches, Movie clips

Unit III : **Reading and Vocabulary:** Reading comprehension passages, Vocabulary building

Unit IV : **Speaking Skills:** Narrations, Public speaking, Debate/Turn Coat

Unit V : **Writing Skills:** Precis Writing, Personal Letter Writing, General Essay Writing

TEXTBOOKS

Foundational English II Textbook/Course Material - Prepared by the school.

REFERENCE BOOK

Sargeant and Howard. *Basic English Grammar Book 2*. Irvine: Saddleback, 2007. Print.

SEMESTER II

21CSAV02T1 DIGITAL MARKETING - (0+3) CREDITS

OBJECTIVES

The Course aims to

- Introduce the concepts of digital marketing
- Provide the knowledge in Digital marketing sites
- Give experience to the students to sale their products in Digital medias

LEARNING OUTCOME

On completion of the course, students should be able to

CO1: Students gain an overall understanding of Digital Marketing and insight onCurrent Trends – Digital and Social Statistics (Infographics)

CO2 : Provide an introduction to Digital Marketing Platforms like Facebook,Twitter, YouTube

CO3: Pinterest, etc. Introduction to the basics of Search Engine Optimization(SEO) and Mobile Marketing

CO4: Introduction to various strategies involved in Marketing products and Services Digitally.

PRACTICAL SCHEDULE

1. Creating Facebook page Uploading contacts for invitation
2. Exercise on fan page wall posting Increasing fans on fan page
3. How to do marketing on fan page (with examples)
4. Fan engagement important apps fan page marketing
5. Facebook advertising
6. Types of Facebook advertising
7. Best practices for Facebook advertising
8. Understanding edge rank and art of engagement
9. Creating Facebook advertising campaign targeting in ad campaign
10. Payment module- CPC vs CPM vs CPA
11. LinkedIn Marketing
12. Understanding LinkedIn Company profile vs Individual profiles
13. Understanding LinkedIn groups
14. LinkedIn publishing
15. Twitter Marketing
16. Twitter advertising
17. Uploading videos on video marketing websites
18. YouTube for business

19. YouTube video marketing Strategies
20. Bringing visitors from YouTube videos to your website
21. Google Analytic account
22. Setting up Google Ad words account
23. Working with online advertisement platforms
24. Setting up email marketing account
25. Creating a broadcast email
26. Setting up auto responders
27. Sending bulk emails
28. Make money with adsense

REFERENCE BOOK

1. Seema Gupta Digital Marketing Mc-Graw Hill 1 st Edition - 2017Ian
2. Dodson The Art of Digital Marketing Wiley Latest Edition
3. Puneet Singh Bhatia Fundamentals of Digital Marketing Pearson 1 st Edition –2017
4. VandanaAhuja Digital Marketing Oxford University Press Latest Edition
5. Philip Kotler Marketing 4.0: – Moving from Traditional to Digital Wiley 2017

SEMESTER II

21SPOU0001- SPORTS AND GAMES (1 CREDIT)

OBJECTIVES

- The Course aims to gain knowledge about the Fitness, Sports and Games**.**

LEARNING OUTCOME

Students should be able to

- Assess the fitness level.
- Demonstrate skills in indigenous game.
- Demonstrate skills in major Sport and game.
- Learn the basic skills involved in field event.
- Know about recreational games and latest fitness assessment tools.

THEORY

		CONTENT	No.of Hours
Unit I	:	Concept of Health Related Fitness (HRF) Test – Assessment of HRF test.	**3**
Unit II	:	Introduction to Yo -Yo tests - Basic skills in Kabaddi.	**4**
Unit III	:	Fundamental skills in Field Hockey / Volleyball	**3**
Unit IV	:	Introduction to Track and Field Events - Procedure for 4 X100 Meters Relay - Tournaments (Intramural and Extramural tournaments) - Methods to draw the fixture for knockout and league tournaments.	**3**
Unit V	:	Introduction to Common athletic injuries and first-aid - Recreational activities (Minor games) – Basic skills in Shot put / Javelin throw.	**3**

TEXTBOOKS

1. Bonnie Kenny and Cindy Gregory, (2006), Volleyball (Steps to Success), (3ED), Human Kinetics Publishers, Champaign, USA.
2. Elizabeth Anders and Sue Myers, (2008), Field Hockey (Steps to Success), Human Kinetics Publishers, Champaign, USA.
3. James R.Morrow, Jr., Allen W.Jackson, James G.Disch and Dale.P.Mood, (2000), Measurement and Evaluation in Human Performance, (2ED), Human Kinetics Publishers, Champaign, USA.
4. Ken O. Bosen, (1973), Track & Field Fundamental Techniques NIS Publications, Patiala.
5. Rule Book, (2014), Provinces battling for the Indigenous Games champs trophy.

REFERENCE BOOK

1. Kamlesh, M.L.,(1987), Management Concepts Physical Education and Sport Metropolitan Book Co., Pvt., Ltd., Nethaji Subhash Marg, New Delhi.

Thirunarayanan, C. and Hariharan, S., (1989), Methods in Physical Education, C.T. & S.H.,Publications, Karaikudi.

Web Resources:

1. https://www.iaaf.org/home

2. http://www.indiankabaddi.org/

SEMESTER II

19FATU001 FINE ARTS- (1 CREDIT)

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

22OAEV0210 BASICS OF SEED PRODUCTION – 3 CREDITS

OBJECTIVES

- To teach the theoretical knowledge and practical skills about seed and seed quality.
- To teach the seed certification agencies, seed production, seed treatment and seed storage.

LEARNING OUTCOME

- The students learn about the seed production and seed treatment practices.
- The students learn about the seed processing and certification.

THEORY

Unit I **Seed and seed quality:** Seed and grain- Seed quality characteristics- Classes of seeds-Supply and demand.

Unit II **Plant Breeding in Seed Production:** Mode of reproduction- Asexual reproductive (vegetative production and apomixis) and sexual reproduction- classification of crop species on the basis of mode of pollination- self pollination- mechanisms- genetic consequences of self pollination-cross pollination-mechanisms- genetic consequences of cross pollination-male sterility-seed production techniques in major crops- cereals, pulses, oilseeds and vegetable crops.

Unit III **Organic Seed Treatment:** Organic seed treatment-Priming-Pelleting-Choice of crop varieties- Traditional quality seed selection- Crop management strategies- Organic farming techniques- Organic seed treatment in cereals, pulses, oilseeds and vegetable crops.

Unit IV **Harvest and Post-harvest processing:** Method of harvest**,** Threshing-post-harvest processing-seed cleaning, drying and separation for grain cereals and vegetables - traditional seed storage methods

Unit V **Agencies and Regulations for seed production:** National, International agencies of Government and Non-Governmental –Regulations for seed production- Seed Testing centers-quality-Seed Certification.

SEMESTER II

22OAEV0211 BASICS OF SEED PRODUCTION – 2 CREDITS

PRACTICAL SCHEDULE

1. Collection of seed varieties
2. Exploration of wild species
3. Identification of seed structure
4. Seed structure and floral biology of cereal crops, Pulse crops
5. Seed structure and floral biology of Oilseed, Vegetable Crops
6. Methods of seed germination, seed viability and vigour
7. Methods of pre-soaking of seeds for germination
8. Methods and types of Seed Sampling
9. Seed Testing and Physical purity
10. Seed Germination test and Seed Moisture test
11. Seed Dormancy breaking Treatments
12. Seed Treatment method
13. Visit to seed production farm and seed processing unit
14. Final Practical Examination

REFERENCES

1. Agarwal.R.L.2004. Seed Technology, IVth Edition, Oxford and IBH Publishers Company, New Delhi.
2. Ramamoorthy, K. and K. Sivasubramaniam. 2006. Seed Technology, Reddy Recknoner, Agrobios Publishers, Jodhpur, Rajasthan.
3. Sivasubramaniam.K. and S.K. Yadav. 2007. A Dictionary of Seed Technological Teems, Kalyani Pubilishers, Ludhiana.

SEMESTER II

22OAEV0212 SUSTAINABLE AGRICULTURE AND FARMING SYSTEMS – 2 CREDITS

OBJECTIVES

- The students will be familiarized with the importance of sustainable agriculture.
- The students will be taught with the different farming systems in organic agriculture.

LEARNING OUTCOME

- The students are well known about the system of farming pattern and maintain the sustainability of natural resources.

THEORY

Unit I : **Sustainable Agriculture**: Introduction – adverse effects of conventional agriculture – definition – concept – goals – elements and current status of sustainable agriculture in India- Factors effecting ecological balance and sustainability of agricultural resources and Bio diversity and conservation-introduction –land /soil related problems- soil degradation , deforestation , accelerated soil erosion , siltation of reservoirs etc. –causes and extent of these problems in India and ameliorative measures.

Unit II : **Water Resources Management:** Water logging – salinization and alkalization in command areas – extent of these problems in India and Tamilnadu – prevention , control and reclamation measures – sea water inundation and sand casting during cyclonic storms and their effects on agriculture- Rain water harvesting and ground water recharge – resource availability in India and Tamilnadu –Ground water development scenario – over exploitation problems and safe yield concept.

Unit III : **Environmental Pollution** : Introduction – greenhouse effect and potential effects on agriculture –depletion of ozone layer , methane emissions from rice fields and mitigation options- Fertilizers as a source of pollution and control measures-introduction – nitrate pollution in soil and ground water and eutrophication management factors to reduce fertilizer pollution- Pesticides as source of pollution and decontamination measures – bio repellents-Definition and advantages.

Unit IV : **Natural Resources Management :** Introduction – land – water – irrigation problems – impact on low external input agriculture(ILEIA) and low external inputs for sustainable Agriculture (LEISA) – vegetative cover – present scenario and management practices-Conjunctive use of water – definition – objectives – types – advantages and limitations – wasteland and their management – definition classification – distribution in India and Tamilnadu– need for development and regenerative measures.

Unit V : **Farming Systems:** System approach- farming system – determinants of farming system - cropping systems and related terminology - Biogas plant- Crop rotations- Definition and advantages- Intensive cropping - Intercropping- Mixed cropping, Multitier cropping, Sequential cropping, Cover cropping, Trap cropping, Bund cropping- Need and advantages- indices- Land Equivalent Ration (LER), Harvest Index (HI) and Crop Equivalent Yield (CEY) -Integrated organic farming systems (IOFS)- Definition, Advantages, Types of IOFS- IOFS for different ecosystems- components of IOFS-, Cropping based IOFS- Livestock based IOFS, Tree based IOFS, Interaction based IOFS, Case studies in IOFS- Resource recycling in IOFS.

SEMESTER II

22OAEV0213 SUSTAINABLE AGRICULTURE AND FARMING SYSTEMS

(2) CREDITS

PRACTICAL SCHEDULE

1. Preparation of farming system to suit different irrigated and garden land situations.
2. Preparation of farming systems to suit to dry land situation and visit.
3. Preparation of Compost.
4. Preparation of Vermi wash
5. Preparation of Enriched Farmyard Manure (EFYM)
6. Recycling of urban waste and food-degradable and non degradable.
7. Use of bio – repellents.
8. Preparation of project proposals for land development.
9. Management of problematic soils.
10. Management practices to prevent environmental deterioration for sustainable agriculture.
11. Visit to wetland farm and garden land farm – observation on resource allocation, recycling of inputs and economics.
12. Visit to dry land farm – observation on resource allocation, recycling of inputs and economics.
13. Methods of profitable utilization of agriculture wastes, agriculture by products and agro-industry wastes.
14. Final Practical Examination

REFERENCES

1. Arun ,K. Sharma. 2006. A Hand Book of Organic Farming .Agrobios(India), jodhpur.
Dahama ,A.K.2007.Organic Farming for Sustainable Agriculture. Agrobios(India), jodhpur.

2. Dalela, R.C. and Mani, U.H.1985. Assessment of Environmental Pollution. Academy of Environmental Biology , Muzaffarnagar.
3. Deb, D.L.1994. Natural Resources Management for Sustainable Agriculture and Environment. Angkor publishers Ltd.,New Delhi.
4. Saroja Raman. 2006. Agricultural Sustainablity – Principles , Processes and Prospects. Food Products press, New York.
5. Ruthenburg , H.1971 . Farming Systems in Tropics . Clarendon press, London.
6. Subramaniyan , S.2004. Globalization of Sustainable Agriculture . Kalyani publishers,Ludhiana.
7. Thampan, P.K.1993. Organics in soil Health and Crop Production . Peekay Tree crops Development Foundation , Cochin.
8. Purohit ,S.S.2006. Trends in Organic Farming in India. Agrobios (India), Jodhpur.
9. Ranganathan, T.T., K.Govindan and T.Senthivel, 2006. Sustainable Agricultural Practices. ETC foundation- COMPAS The Netherlands and Faculty of Agriculture and Animal sciences, December 2006.

SEMESTER II

22OAEV0214 WATER AND IRRIGATION MANAGEMENT-2 CREDITS

OBJECTIVES

- The students will be familiarized with the irrigation and crop water requirement concepts.
- The students will be taught with the drainage and problems in the usage of water sources.

LEARNING OUTCOME

- The students are well known with the handling of crops with better water requirement and irrigation resources including drainage.

THEORY

Unit I : **Importance of Irrigation:** Definition- Water resources of India and Tamil Nadu- Need for irrigation- Sources of Irrigation- Natural streams and rivers, surface resources, underground resources- History and development of Irrigation in India and Tamil Nadu- Irrigation systems of India and Tamil Nadu- Ground water- Aquifer- Well irrigation- Classification- Open and bore well- Merits and demerits of tube wells- Role of water in plant growth.

Unit II : **Irrigation and Crop Water Requirement:** Irrigation Requirement- Net Irrigation requirement (NIR) and Gross Irrigation Requirement (GIR)- Evapotranspiration- Evaporation, Transpiration, Potential Evapo Transpiration (PET)- Crop Co-efficient- Effective rainfall- Factors affecting crop water requirement- Consumptive Use (CU)- methods of estimation of crop water requirement- Critical stages for irrigation- Water requirement of crop.

Unit III : **Scheduling and Methods of irrigation:** When, how and how much to irrigate- different approaches- Methods of irrigation- Surface, sub-surface, sprinkler and drip irrigation- surge irrigation- Micro irrigation- layout, suitability, merits and scope- Fertigation- Water Use Efficiency (WUE)- Methods to improve WUE- Conjunctive use of surface and ground water potential- Water management for major field crops of Tamil Nadu.

Unit IV : **Watershed Management and Water harvesting structures:** Definition, Principles, Objectives and benefits, Water shed development methods, Water harvesting structure- Temporary gully control structures- Brush dam, Rock dam, Permanent gully control structures- Drop spillway, Chute spillway, Drop inlet spillway, Percolation pond, Farm pond and Sunken Pond, Sand storage dam- its merits and demerits.

Unit V : Drainage and problems in water use: Drainage- Definition- Effects of water logging, Benefits of Drainage- Classification of Drainage- Quality of irrigation water- Agronomic practices for use of poor quality water (Saline, Effluent and sewage water).

SEMESTER II
22OAEV0215 WATER AND IRRIGATION MANAGEMENT-2 CREDITS
PRACTICAL SCHEDULE

1. Estimation of soil moisture by gravimetric method and Tensiometer.
2. Estimation of soil moisture by resistance blocks and Neutron probe and other improved devices.
3. Measurement of irrigation water with fumes and weirs.
4. Calculation of irrigation water based on source, water flow, soil moisture status and depth of irrigation.
5. Land leveling and land shaping-Beds and Channels- Ridges and Furrows.
6. Land leveling and land shaping for border strips- Broad Bed and Furrow (BBF) method of irrigation.
7. Operation and maintenance of drip and sprinkler irrigation systems
8. Estimation of crop water requirement by direct and indirect methods
9. Scheduling of irrigation based on indicator plants, soil-sand mini plot techniques
10. Scheduling of irrigation based on depletion of available soil moisture and IW/CPE ratio
11. Calculations on Irrigation efficiency parameters
12. Assessment of irrigation water quality parameters
13. Observation of irrigation structures in wetlands and irrigated drylands
14. Visit to water management and training Institutes
15. Final Practical Examination

REFERENCES

1. Sharma, S.K. 1984. Principles and Practices of Irrigation Engg., S.Chand and company Ltd.,New Delhi.
2. Michael, A.M. and T.P.Ojha. 1987. Principles of Agricultural Engineering. Vol.2. Jain Brothers, New Delhi.
3. Michael, A.M. 1997. Irrigation- Theory & Practice, Vikas Publishing House, New Delhi.
4. Sankarareddy, G.H. and T.Yellamananda Reddy, 1997. Efficient use of Irrigation Water, Kalyani Publishers, New Delhi.

SEMESTER II

22OAEV0216 SOIL HEALTH AND NUTRIENT MANAGEMENT-2 CREDITS

OBJECTIVES

- The teach the concepts of soil fertility and objectives of crop rotation, composting technology and methods of composting.
- The students will be taught with the different types and characteristics of organic manures and biofertilizers.

LEARNING OUTCOME

- The students are well known about the importance of soil fertility and uses of organic manures, compost and biofertilizers for the soil fertility management in sustainable agriculture.
- The students aware about the uses and method of preparation and application of manures and bio-fertilizers.

THEORY

Unit I : **Soil-Health Management:** Soil- Definition- Composition of soil – Types of soil found in India and Tamil Nadu- Physical and chemical properties of soil. Importance–Soil fertility and productivity – Organic matter/ organic carbon– 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) and biochar-definition- types – Methods of Application - Their Benefits and Significance

Unit II : **Cropping Pattern:** Introduction – Principles of Crop Rotation- Effects of Crop Rotation- Balanced and Economic Nutrient Absorption, Soil fertility and health, Legume effect. Efficient resource utilization, Soil moisture utilization, Reduction in soil erosion.-Agronomical practices for cropping system- Land preparation, Manuring, Water management, Selection of Cropping pattern - Advantages of Cropping pattern.

Unit III : **Crop Residue Management :** Introduction- Organic Resources Available for Manuring and Composting- Compost and Composting- Stages of Composting- Mesophilic stage, Thermophilic stage, Curing- Principles of Composting- Types of Composting- Aerobic Decomposition, Anaerobic Decomposition, Vermicomposting- Methods of Composting- Indore method, Bangalore method, Coimbatore method, Mechanical compost plants, NADEP Method, Rapid Composting Method and Other methods of composting-Mulching-definition – methods and advantages.

Unit IV : **VermiComposting** – External features of Earthworm- Lifecycle of Earthworm- Types of Earthworm used for Vermicomposting- Characteristics of Vermicompost- Chemical, Physical and biological- Vermicompost Preparation, Vermiwash, humus- Advantages of manures and compost.

Unit V : **Bio-fertilizers :** Introduction- Types of Biofertilizers and their Description- Nitrogen fixing biofertilizers, Rhizobium, Blue green alagae, Azospirillum, Azotobacter, Acetobacter, Frankia, Phosphorus Solubilising Microorganisms, Vesicular Arbuscular Mycorrhiza (VAM).- Methods of Biofertilizer Inoculation (application)- Seed Inoculaiton, Root and Seedling treatment, Soil application, Self inoculation.- Advantages- Constraints in Biofertilizers.

SEMESTER II

22OAEV0217 SOIL HEALTH AND NUTRIENT MANAGEMENT- 2 CREDITS

PRACTICAL SCHEDULE

1. Sampling, Collection, processing, preservation and storage of soil samples
2. Sampling, Collection, processing, preservation and storage of water samples
3. Determination of soil texture and colour
4. Estimation of soil pH and EC
5. Estimation of soil organic carbon
6. Identification of Bulky organic manures (BOM)
7. Identification of Concentrated organic manures (COM)
8. Preparation of different types of compost
9. Preparation of Vermicompost
10. Compost maturity indices
11. Identification of Green and Green leaf manures
12. Identification of biofertilizers
13. Preparation of leaf extract for soil fertility
14. Final Practical Examination

REFERENCES

1. Palaniappan, S.P.(1998). Cropping Systems in the Tropics (Principles and Management). Wiley Eastern Limited. New Delhi and Tamil Nadu Agricultural University Coimbatore, TN.
2. Das, P.C.(1998). Manures and Fertilizers. Kalyani Publishers, New Delhi.
3. Gupta, P.K. (2003). Vermicomposting: Sustainable Agriculture, Agrobios (India) Jodhpur (Rajasthan).
4. Kannaiyan, S.(2000). Biofertilizers- Key Factor in Organic Farming. The Hindu Survey of Indian Agriculture. Published by S.Rangarajan on behalf of M/s Kasturi and Sons Ltd. At the National Press, Kasturi Building, Chennai.
5. Ranganathan, T.T., K.Govindan and T.Senthivel, 2006. Sustainable Agricultural Practices. ETC foundation- COMPAS The Netherlands and Faculty of Agriculture and Animal sciences, December 2006.

SEMESTER II

EXPERIENTIAL LEARNING -II

22OAEV0218 BIOFERTILIZER AND COMPOSTING TECHNOLOGY– 6 CREDITS

BIOFERTILIZER

1. Introduction
2. Types of Biofertilizers and their Description
3. Nitrogen fixing biofertilizers
4. Rhizobium
5. Blue green alagae (BGA)
6. Azospirillum
7. Azotobacter
8. Acetobacter
9. Frankia
10. Phosphorus Solubilising Microorganisms
11. Vesicular Arbuscular Mycorrhiza (VAM)
12. Methods of Biofertilizer Inoculation (application)
13. Seed Inoculaiton, Root and Seedling treatment
14. Soil application and Self inoculation
15. Advantages and constraints of biofertilizers

COMPOSTING TECHNOLOGY

1. Introduction
2. Organic Resources Available for Manuring and Composting
3. Compost and Composting
4. Stages of Composting- Mesophilic stage, Thermophilic stage,
5. Curing- Principles of Composting
6. Types of Composting- Aerobic Decomposition
7. Anaerobic Decomposition
8. Preparation of Vermicomposting
9. Methods of Composting
10. Indore method, Bangalore method, Coimbatore method, Mechanical compost plants, NADEP Method, Other methods of composting
11. Factors Affecting Composting
12. C/N Ratio of the Bedding Materials, Blending and Shredding, Moisture, Temperature, Oxygen or Aeration, pH.

SEMESTER III

22OAEV0319 - ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT- 2 CREDITS

Objectives

- To learn the importance in conservation of environment and natural resources
- To learn causes effects and control measures of environment pollution
- To understand the concepts of disaster management and preparedness to overcome

Learning Outcome

- Students will learn about the importance of environment and ecosystem.
- This course provides knowledge about the social issues and management of disaster.

Unit I : **Natural resources :** Introduction to environment and natural resources (definition, scope and important) - forest resources: use and over-exploitation of forest resources and its impact on forest and tribal people-Water Resources : Use and over – exploitation of water and impact – Land degradation and soil- erosion, desertification-Food resources, Energy Resources- renewable and non renewable and alternative energy sources.

Unit II : **Ecosystem and Biodiversity: Bio diversity-** Types, Mega bio diversity – threats, endemic and endangered species, Conservation of Biodiversity: In-Situ and Ex-Situ conservation of biodiversity- bio-sphere reserves.Eco-system- concept, structure and functions, energy flow in the eco system and its types.

Unit III : **Environmental Pollution:** Air Pollution, Water pollution, Soil Pollution Noise Pollution and Solid waste management- Causes, effects and Management

Unit IV : **Social Issues and the Environment**: Sustainable development, Rural Urban problems related to environment-Environment ethics: Issues and possible solutions, Environmental Acts and organizations.

Unit V : **Disaster Management:** Disaster: Meaning and concepts, types, cause and management –Effects of disaster on community, economy, environment-Disaster management cycle: early response, rehabilitation, reconstruction and preparedness- vulnerability Analysis and role of community in Disaster Mitigation-The National Disaster Management Authority (NDMA): Case studies

SEMESTER III

22OAEV0320 - ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT- 2 CREDITS

PRACTICAL SCHEDULE

1. Environmental sampling and preservation
2. Biodiversity assessment in Agricultural system
3. Water quality analysis: pH and EC
4. Analysis of TDS and TSS
5. Analysis of Acidity and Alkalinity
6. Analysis of Water hardness (CO_3 and HCO_3)
7. Analysis of DO and BOD
8. Analysis of COD,
9. Analysis of *E.coli.*
10. Visit to Contaminated site
11. Visit to Common Effluent Treatment Plant
12. Visit to flood /Tsunami / Earth quake affected areas/ mining/land slides
13. Visit to State Pollution Control Board (SPCB)
14. Final Practical Examination

REFERENCES

1. A text book of Environmental Studies , 2005, Erach Bharueha, UGC, University press, New Delhi.
2. A text book of Environmental Studies, 2003, Thangamani and Shyamala, Pranav Synicate, Publication Division, Sivakasi.
3. A text book of Environmental Studies, 2006, Asthana, D.K., Meera Asthana, S. Chand & Company Ltd., New Delhi.
4. Environmental Studies, 2005, Benny Joseph, Tata Macgraw – Hill Publishing Company, New Delhi.
5. Panchayats in Disaster: Preparedness and Management, 2009, palanithurai, G., Concepts Publishing company

SEMESTER III

21NSSU0001 NSS - 1 CREDIT

Objectives

- To know the history, philosophy, principles of NSS and working with people

- To know the role and responsibility of volunteers.

Learning Outcome

- Student able to know to know the history, philosophy, principles of NSS and working with people, role and responsibility of volunteers.

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

References:

Text books:

1. Advi Reddy, 1996, Extension Education Babatal Publications, Hyderabad
2. Narayanasamy, N, M.P.Boraian and R. Ramesh, 1997, Participatory Rural Appraisal, GRU, Gandhigram.
3. National Service Scheme Manual1 1997. Department of Youth Affairs and Sports, Ministry of Human Resource Development, Government of India.
4. Supe, S.V. 1995, Extension Education, Sterling Publications, Madras

SEMESTER III

21SSCU0001 SHANTHI SENA- 1 CREDIT

Objectives

- To introduce the concept, experiments and practice of Shanti Sena (Peace Brigade) to the

students.

- To give exposure and training to students in the skills needed for Shanti Sena and Nonviolent Conflict Resolution.

Learning Outcome

Student will be able to:

- Comprehend the concept of Nonviolence, Shanti Sena and Methods of Peaceful Resolution of conflicts in their personal and social life.
- Shape and evolve themselves as peacemakers and peace builders for promoting harmony and good will among all.

Unit I : **Shanti Sena:** Meaning and Conceptual framework- historical development- Gandhiji's idea of Shanti Sena- Gandhiji as peace Maker and Builder- Shanti Sena Experiments in Noakhali by 'One Man Boundary Force'- Gandhiji as Martyr and peace soldier.

Unit II : **Post Gandhian Experiments:** Birth of Shanti Sena- Vinoba's concept of Shanti Sena- Shanti kendras, All India Shanti Sena Mandal, functions of Shanti Sena- Contributions of Jeyaprakash Narayan and Narayan Desai- Peace work during Communal Violence- Chambal Valley and Nagaland Peace Mission.

Unit III : **Shanti Sena in India and Abroad:** World Peace Brigade (WPB)-Peace Brigade International (PBI)- Sarvodaya Shramadana Sangamaya Shanti Sena, Sri Lanka- Peace Corps in USA and U.N. Peace Keeping Force.

Unit IV : **Skills and Training for Shanti Sena:** Skills for Peace Making and Building (Conflict Resolution and Transformation)- Physical training: Yoga, March Fast, Shramadhan, Spinnning- Skills for First Aid and disaster management.

Unit V : **Shanti Sena Training in GRI & Other Places:** Dr.G.Ramachandran"s contribution-Evolution of Shasnti Sena in GRI-Recent developments and experiments in GRI-Shanti Sena Vidyalaya (Vedchhi)-G.Ramachandran Institute of Nonvilence, Thiruvantapuram,and Non-Killiong Global

academy(Honolulu)

REFERENCES

1. Arunchalam K.,(1985),Gandhi -The peace maker, Gandhi Smarak Nidhi,,\\,Madurai.
2. Dennis August Almedida (2007) The training of youth in Nonvoilence as away to peace, Gandhi Media Centre,Delhi and thiruvananthapuram.
3. Narayan Desai (1972) Towards Non-Violent Revolution, Sarva Seva Sangh Prakashan,Varanasi.
4. ----------, (1963), A Hand Book for Shanthi Sainiks, Sarva Seva Sangh Prakashan,Varanasi.
5. ----------, (1962), Shanti Sena in India, Sarva Seva Sangh Prakashan, Varanasi.
6. Radhakrishnan.N. Dr., (1989), Gandhi and Youth: The Shanti Sena of GRI, Gandhigram Rural Institute, Gandhigram.
7. ----------, (1997), Gandhian Nonviolence: A Trainer's Manual, Gandhi Smiriti and Darshan Samiti, New Delhi.
8. Ravichandran .T., (1999), Communalism in Tamil Nadu (1979-1991) and the Way Out, Gandhi Media Centre, Madurai.
9. Ramjee Singh, (2003), Shanti Sena: A Guide, Sarva Seva Sangh Prakashan, Varanasi.
10. Suresh Ram, Vinoba and His Mission, Sarva Seva Sangh Prakashan, Varanasi.
11. Thomas Weber (1996), Gandhi's Peace Army: The Shanti Sena and Unarmed Peace Keeping.
12. Vinoba Bhave (1961), Shanti Sena, Akhil Bharat Sarva Seva Sangh Prakashan, Varanasi.
13. William Baskaran, M., (1998), Shanti Sena: A Gandhian Vision, Gandhi Media C entre, Madurai.

SEMESTER III

22OAEV0321 FUNDAMENTALS OF AGRICULTURAL MARKETING – 3 CREDITS

OBJECTIVES

- The course is designed to help the students to understand the marketing efforts for rural areas and to provide practically and facilitate enhanced learning.

LEARNING OUTCOME

At the end of the course the students is able to understand

- The importance of rural markets in Indian economy
- Research approach towards rural produce and marketing
- Understanding the rural marketing mix strategies
- Understanding the rural communication and strategy to use it effectively
- Understanding the influence of the social marketing

THEORY

Unit 1 : **Principles of Marketing :** Definition of market and marketing, evolution of marketing in India, scope, importance and need of agricultural marketing and markets, classification of markets, difference of agricultural marketing with other commodities marketing.

Unit II : **Marketing Functions :** Main marketing function from original producers to ultimate consumer; Assembling, pooling, collection, processing, Distribution, Secondary functions-Buying, selling, storage, transportation, standardization and grading, packaging, financing, Risk bearing, Market information.

Unit III : **Market functionaries:** From Procedure to consumer, Whole seller, Retailer, Broker, Commission agent, Speculators Processors, Financing institutions, need and importance of intermediaries.

Unit IV **Regulated and un-regulated markets:** Regulated market in India, Role of regulated markets, their organization, problems and prospects. Types and function of Agricultural Produce Marketing Committee.

Unit V : **Price Policies:** Review of price policy for commercial crops and food grains since independence, price policies and complement policies of control on suppliers and distributors. Problems and prospects, Commission for agriculture cost and prices objectives, function and role in stabilization of agriculture prices.

SEMESTER III

22OAEV0322 FUNDAMENTALS OF AGRICULTURAL MARKETING – 2 CREDITS

PRACTICAL SCHEDULE

1. Study of various marketing functions for agricultural products.
2. Various marketing channels involved in flow of agriculture goods.
3. Demand and supply of agricultural commodities.
4. Study of seasonal variation in price of agricultural commodities.
5. Time series analysis for agricultural goods.
6. Study of regulated market, organization and benefits.
7. Cooperative marketing, function, organization, visit of various cooperative marketing organization.
8. Pricing policies of agricultural products.
9. Visit in different types of markets and study of the main functions of them.
10. Prepare a report on various Agricultural goods marketing.
11. Visit Organic products marketing centre and make a comparative study with the conventional / Uzhavar Santhai products
12. Final Practical Examination

REFERENCES:

1. Marketing Management written by Philop Kotler
2. Fundamentals of Marketing by William J. Stanton and Charles Futrell
3. Rural Marketing - By Ravindra Nath
4. Acharya, S.S. and Agarwal, N.K. (1992). Agricultural Marketing in India, IBH, Publishing Ltd., New Delhi.
5. Francis Cherunilam, (2000). International Economics, Oxford & IBH, New Delhi.

SEMESTER III

22OAEV0323 ORGANIC PRODUCTION OF FIELD 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 : **Cereals:** Rice, Wheat, maize , barley , Oats , Rye and triticale

Unit II : **Millets:**

a) Major millets : Sorghum , Pearl millet , and Finger millet

b) Minor millets : Barnyard millet , Foxtail millet , Little millet, kodo millet and common millets

Unit III : **Pulses:** Redgram , Bengal gram , Blackgram , Green gram , Cowpea , Soybean , Horse gram and Lentil.

Unit IV : **Oilseeds:** Groundnut, Sesamum, Sunflower, Mustard, Rapeseed, Castor, Safflower, Niger and Linseed.

Unit V : **Commercial and Forage Crops :** Cotton, Jute, Sugarcane and Tobacco, Cumbu napier, Guinea grass, Water grass, Cenchrus, Dinanath grass, Fodder sorghum and Pearl millet,Lucerne, Berseem.

REFERENCES

1. Ahlawat, I.P.S.,Om Prakash and G.S.saini.1998. Scientific Crop Productionj in India. Rama Publishing House, Meerut.
2. Chatterjee, B.N. and K.K.Bhattacharyya.1986. Principles and Practices of Grain Legume Production. Oxford and IBH Publishing Co.Pvt.ltd.,New Delhi.
3. Chidda Singh.1997. Modern Techniques of Raising Field Crops. Oxford and IBM Publishing Co. Pvt.Ltd., New Delhi.
4. Das,P.C.1997 Oilseed Crops of India,Kalyani Publishers,New Delhi
5. John, M.M.1987.Cotton.Longman Scientific andTtechnical ,New York

SEMESTER III

22OAEV0324 ORGANIC PRODUCTION OF 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, Fig, Amla, Anola, Pomegranate, Cashewnut, Apple, Pear, Peach, Plum, Apricot, Avacado and Mangosteen.

Unit II : **Vegetable crops**: Solanaceous vegetables- Tomato, Brinjal, Potato, Root crops-Beetroot, Radish, Turnip, Bulb crops-Onion, Garlic, Cole crops-Cabbage, Cauliflower, Cucurbitaceous- Bottle gourd, Ridge gourd, Bitter gourd and Malvaceous vegetables- Bhendi.

Unit III : **Loose flowers and cut flowers** : Rose, Jasmine, Marigold, Chrysanthemum, Tuberose and Crossandra, Gerbera, Carnation, Gladiolus, Anthurium

Unit IV : **Spices and Plantation crops**: Pepper, Cardamom, Ginger, Turmeric, Coriander and Cumin, Coconut, Arecanut, Tea, Coffee, Cashewnut, Cocoa, Palmyarh, Oilpalm.

Unit V : **Medicinal and Aromatic Plants**: Aloe vera, Aswangandha, Glory lily, Periwinkle, Sarpagandha, Senna, coleus, Tipili, Dioscorea sp, Rosemary, Geranium, Lemon grass, Mint, Vetiver, Patchouli,Citronella and wild collections.

REFERENCES

1. Bose, T.K. 1986. VEGETABLE Growing in India. Naya Prakash Publication, Calcutta.
2. Das,P.C., vegetable Crops of India. Kalyani Publication, New Delhi.
3. Bose, T.K. and P. Yadav. 1989. Commercial flowers. Naya Prakash Publications, Calcutta.
4. Kumar, N. 1997. Introduction to horticulture. Rajalakshmi Publication, Nagercoil.
5. Randhawa, G.S. and A. Mukhopadhyay. 1986. Floriculture in India. Allied publishers (P) Ltd., New Delhi.
6. Robert Bentley and Henry Trimen. 2002. Medicinal plants, Omsons Publications, New Delhi.
7. Nursadh Ali. 2008. Medicinal Plants cultivation, Mittal publications, New Delhi.

22OAEV0325 ORGANIC PLANT PROTECTION FOR FIELD AND HORTICULTURAL CROPS-3 CREDITS

OBJECTIVES

- To learn the acquaint yourself with cultural and mechanical methods employed to manage diseases and pests in the crops grown under organic farming.
- To know about the various plants that can be used in pest management.
- Acquaint yourselves with a variety of bio-pesticides.
- To know the different bioagents that are helpful in organic farming.

LEARNING OUTCOME

- Acquiring knowledge by the importance of plant protection.
- Methodology of utilization of these plants in different ways.
- Understand the utilization of bio-pesticides for managing pests.
- Understand the methods of using these bioagents.

THEORY

Unit I : **Cultural Practices :** Introduction- Cultural practices- use of cleaned seeds, Pre sowing irrigation, summer ploughing, crop rotation, Trap crops, Intercropping, Mixed cropping, Use of Tolerant/Resistant varieties, manipulations in sowing dates, Irrigation/ Flooding, Destruction of volunteer plants, Management of alternate Host plants- Principles of cultural practices.

Unit II : **Mechanical Practices:** Shaking the branches- handpicking and killing- Traps- Spike Thrust Method- Tree banding- Trenching- Tree paste- Advantages of cultural methods.

Unit III : **Botanicals:** Introduction- Botanical pesticides- Malabar nut, Neem, Sweet flag, Custard apple ,Tumeric, Asafoetida, Onion, Chiili, Crown flower, Castor bean, Tobacco, Hitch hikers, Lantana camera, Coriander, Tulasi, Marigold- Plant disease management- Advantages of Botanical Pesticides.

Unit IV : **Bio-repellents:** Introduction- Classification of Biorepellents- Bacterial Biorepellents- Fungal Biorepellents- Viral Biorepellents - Culture of Insect pathogens- Management of Plant Diseases- Advantages of Biorepellents- Precautions while using the Bio-repellents.

Unit V : Bio-Control Agents: Introduction- Biological Control Procedures- Biological control agents- Criteria of a successful Bio-control agents- Advantages of Bio-Control Agents- Some classical Examples of Bio-control agents.

22OAEV0326 ORGANIC PLANT PROTECTION FOR FIELD AND HORTICULTURAL CROPS-3 CREDITS

PRACTICAL SCHEDULE

1. Methods of pest Management
2. Identification of major pest for field and horticultural crops
3. Preparation of various botanicals
4. Preparation of various bio-control agents
5. Identification of predators, parasitoids and pathogens.
6. Different management methods for pest of cereals and pulses
7. Different management methods for pest of oilseeds
8. Different management methods for pest of commercial crops
9. Different management methods for pest of vegetable crops
10. Different management methods for pest of fruit crops
11. Different management methods for pest of medicinal crops
12. Different management methods for pest of aromatic crops
13. Identification and management of weeds
14. Final Practical Examination

REFERENCES

1. Panwar V.P.S.2000.Agricultural Insect Pests of Crops and their control, Kalyani Publishers, New Delhi.
2. Mohan S, Devasenapathy P. Pest and Disease Management in Organic Ecosystem, Project Directorate For Cropping Systems Research Modipuram, Meerut.

SEMESTER III

22OAEV0327 FIELD PLACEMENT TRAINING – 4 CREDITS

Field placement training with organic farmers field for a period of 15 days. The students should learn the crop production practical skills related to the organic farming. The details of practicals learnt by the students in field placement training to be documented, presented and submitted for evaluation.

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

Evaluation Pattern

Organic farmers field (15 days)		
S.No.	**Parameters**	**Maximum marks**
1	Participation	10
2	Crop production	10
3	Harvesting and Marketing skills	10
4	Demonstration on nearby villages	10
5	Observation note book	10
6	Chart preparation (15days activities with photos)	10
7	Documentation and report submission	10
8	Oral Presentation	10
9	Behaviour	10
10	Attendance	10
	Total	**100**

SEMESTER III

EXPERIENTIAL LEARNING -III

22OAEV0328 BIOREPELLENTS AND BIOCONTROL AGENTS – 6 CREDITS

BIOREPELLENTS

1. Neem asthiram
2. Chukku asthiram
3. NeeM seed liquid manure
4. Ponnim
5. Herbal leaf extract
6. Plant oil
7. E.M.Karaisal
8. Bamboo E.M.Karaisal
9. Ginger, Garlic, Green Chilli Karaisal (3G)
10. Agni asthiram
11. Bramasthiram
12. Bejamirtham
13. Neem Pungan Karaisal
14. Manpanani Sedi Thailam
15. Arappu Moor Karaisal
16. Thulasi leaf Karaisal
17. Dasagavya
18. Birds Perches
19. Turmeric Karaisal
20. Vasambu
21. Asafoetida
22. Papaya leaf Karaisal
23. Neem oil Karaisal
24. Neem and Thulai Karaisal
25. Castor oil and castor oil cake based liquids
26. Aloevera Karaisal
27. Enriched Jeevamirtham
28. Fish amino acid
29. Ginger karaisal
30. Colour trap
31. Light trap
32. Colour sticky trap
33. Food trap

BIOCONTROL AGENTS

1. Introduction of Bioagents
2. Ideal characteristics of bioagents
3. Successful examples of biological control
4. General classification: Important insect orders bearing predators and parasitoids used in pest control.
5. Identification of major parasitoids and predators commonly used in biological control of crop pests.
6. Major parasitoids: *Trichogramma* sp., *Chelonus blackburni, Cotesia* (Apanteles) sp., *Bracon* sp., *Epiricania melanoleuca, Goniozus nephantidis, Campoletis chloridae*
7. Major predators: *Chrysoperla* sp., Australian lady bird beetle- *Cryptolaemus montrouzieri,*
8. Weed killers: *Zygogramma bicolorata, Neochetina* spp.
9. Mass multiplication and field release techniques of some important parasitoids: *Trichogramma chilonis., Chelonus blackburni, Cotesia/ Bracon* sp., *Epiricania melanoleuca, Goniozus nephantidis.*
10. Mass multiplication and field release techniques of some important predators: *Chrysoperla* sp., *Australian lady bird beetle- Cryptolaemus montrouzieri,*
11. Mass multiplication and field release techniques of some important weed killers: *Zygogramma bicolorata, Neochetina* spp.
12. Important species of pollinator and scavengers with their importance
13. Identification of Bio control agents for diseases- *Trichoderma virens, Trichoderma harzianum, Trichoderma viride, Fusarium oxysporum, Ampelomyces quisqualis, Hyphochytrium catenoides, Pythium acanthicum, Aspergillus, Penicillium.*
14. Identification of Bio control agents for nematodes- *Steinernema* spp, *Aphelenchus avenae, Allantonema* spp,*Neotylenchus* spp.

SEMESTER IV

21CSAV04T1 Web Designing - (0+3) CREDITS

Objectives

The Course aims to

- Introduce the concepts of internet and terminologies.
- Enlarge the web designing concepts
- Provide an in-depth training with HTML and JavaScript

Learning Outcome

On completion of the course, students should be able to

- **CO1:**Recall the fundamental concept of computer, Internet and Websites
- **CO2:** Be familiar with the web programming concepts
- **CO3:**Able to write web programs
- **CO4:** Understand the data manipulation using Scripting language
- **CO5:**Build a simple web site

PRACTICAL SCHEDULE

1. Create a simple web site using HTML
2. HTML code to apply the formatting tags in a Web page
3. HTML code to apply the List tags in a Web page
4. HTML code to apply the Table and Table formatting tags
5. HTML code to apply the Form and Form elements
6. HTML code to apply the Frames
7. CSS code to design background
8. CSS code to design text and paragraphs
9. CSS code to design table
10. Simple JavaScript code to understand the variables and operatorsutilization
11. JavaScript code to use control statements
12. JavaScript code to validate the content of the website using functions
13. JavaScript code to connect a database with the website
14. JavaScript code to get and store the registration form
15. XML code define the structure of the document

REFERENCES

1. Web coding Bible, Chong Lip Phang, Chong Lip Phang, 2020
2. Learning Web Design, Jennifer Niederst Robbins, O‟Reilly Publication, 2018
3. JavaScript and JQuery, Jon Duckett, Wiley, 2014

SEMESTER IV

22OAEV0429 – PRINCIPLES OF FORESTRY AND SERICULTURE- 2 CREDITS

Objectives

- To conceptualize the importance of forest and Agro-forestry system.
- To impart knowledge on watershed management and sericulture.

Learning Outcome

- The students can learn the principles and practices of Forestry, Agro-forestry.

Unit I : **Forestry :** Forests and Forestry- Forests in India and Tamilnadu- Distribution- Status- Importance- Their use and conservation- Forest influences- Classification- Role and functions- Production forestry- Plantation forestry- Non Timber Forest Produce (NTFP) – wild collections. Natural dyes.

Unit II : **Silviculture:** Definition- Natural and Artificial regeneration- Silvicultural practices- Seed and Nursery- Planting- Choice of spices- Tending operations- Energy plantation- Strip plantation- Industrial plantation.

Unit III : **Agro Forestry:** Definition- Scope- Concept- Benefits- System in AF- Classification- Choice of Species- Suitability characteristics of tree spp- Multipurpose Trees (MPT) and Nitrogen Fixing Tree sp (NFT). For Agro forestry- Management practices, Natural dyes.

Unit IV : **Basics of sericulture**: History- Moriculture- Exotic varities- Nursery Production- Mulberry cultivation- Pest and disease management- Leaf and shoot harvest- Rearing shed construction-Rearing equipments- Disinfection- Silkworm races- Layings- Incubation- Feeding schedule-Chawkie and Late age rearing- Disease management.

Unit V : **Processing and Marketing of cocoon:** Cocoon Harvesting- Sorting of Cocoon- Transportation- Cocoon Marketing- Grainage- Reeling- Rereeling- Twisting- Silk Marketing- Weaving- Byproducts in sericulture- Value addition- Economic importances of silk- Government schemes in sericulture.

SEMESTER IV

22OAEV0430 – PRINCIPLES OF FORESTRY AND SERICULTURE- 2 CREDITS

PRACTICAL SCHEDULE

1. Non –Timber Forest Produces and their uses
2. Acquiring skills in Preparation of nursery for forest plantation.
3. Seed collection Seed treatment and storage of forest tree species.
4. Planting methods and In situ conservation of soil moisture in plantations.
5. Study of Systems of Agro- forestry and tree species suitable for multipurpose uses.
6. Study of Nitrogen fixing trees and multipurpose trees
7. Study of Agro-forestry options in Tamil Nadu.
8. Study of Natural dyes.
9. Visit to forestry extension Centre – FC and RI, Mettupalayam (TNAU)
10. Visit to Sericulture unit
11. Visit to Sericulture processing unit
12. Final Practical Examination

REFERENCES

1. Luna, R.K. (1998). Plantation Foresting in India, International Book Distributors, Dehradun.
2. FAO, (1991). Agroforestry in Asia and Pacific, RAPA Publications, Bangkok.
3. Nair, PKR (2008). An Introduction to Agro forestry, Sprinage (P) Ltd. New Delhi.
4. David M, Smith. (1989). The practice of Silviculture, EBD Educational Pvt. Ltd., Dehradun.
5. Balavenkatasubbaiah M. Malreddy, Narensra Kumar J.B. (2017). Mulberry Sericulture Technology.

SEMESTER IV

22OAEV0431 INSTITUTIONS AND ORGANISATIONS FOR ORGANIC GROWERS-3 CREDITS

OBJECTIVES

- The students learn about the importance of organic growers in India and Tamil Nadu.
- To impart the students on Institutions and Organizations for Organic growers.

LEARNING OUTCOME

- The students acquire knowledge about the organic farming related institutions and organizations for the cultivation and marketing aspects.

THEORY

Unit I : **Institutions and organizations**- Involved in organic farming sector- international and national levels- principles- vision- scope and importance- activities. **International organization:** The International Federation of Organic Agriculture Movement **(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:** Agricultural and Processed Food Products Export Development Authority **(APEDA) -** stakeholders for facilitating process certification for export of organic products from India which comply with the NPOP - standards- certification bodies – National Accreditation Board for Testing and Calibration Laboratories **(NABL**) –organic products testing by laboratories. National Bank for Agriculture and Rural Development (**NABARD)** – functions- subsidies schemes for organic farming. Biodynamic association of India **(BAI)-** Basics of biodynamic farming system. Food Safety and Standards Authority of India **(FSSAI**) – Food safety and Standards (Organic food) Regulation 2017.

Unit IV : **National Centre Of Organic Farming (NCOF)-** objectives- trainings- regional centres – activities in Participatory Guarantee System India (**PGS)**. Organic Farming Association of India **(OFAI)-** association to promote organic farming community- mission and goals- resources. National Centre for Organic Farming –Ghaziabad UP- objectives and activities and Regional centres.

Unit V : **State Level Institutions:** TNAU- Department of Sustainable Organic Agriculture (SOA) – functions- schemes- Trainings. Department of Agriculture- Tamil Nadu Organic Certification Department (**TNOCD)-**activities- standards- certification-training for registered operators.

22OAEV0432 INSTITUTIONS AND ORGANISATIONS FOR ORGANIC GROWERS/OPERATORS - 2 CREDITS

PRACTICAL SCHEDULE

1. Visit to certified organic farms
2. Study of important records in the Organic farm and their maintenance.
3. Product labeling
4. Visit to organic food processing unit
5. Visit and study of grower group
6. Study of Internal Control System (ICS)
7. Preparation of report for organic farmers field
8. Preparation of report for organic inspection and certification
9. Visit to Tamil Nadu organic certification department
10. Visit to National Accreditation Board for Testing and Calibration Laboratories (NABL)
11. Visit to Non Governmental Organic Certification Agencies
12. Final Practical Examination

TEXT BOOKS

1. Palaniappan.S.P and K.Annadurai 1999, Organic Farming. Scientific Publishers (India) Jodhpur.
2. IFOAM/IOIA (2001). International Organic Inspection Manual
3. National Programme for Organic Production (2005). Department of Commerce, Ministry of Commerce and Industry, New Delhi.
4. Various International Standards (EU regulation, USDA, JAS etc.)

SEMESTER IV

22OAEV0433 PROCESSING OF ORGANIC AGRICULTURAL PRODUCES – 3 CREDITS

OBJECTIVES

- To students learn about the processing of agricultural produces.
- To know about the value addition of cereals and millets.

LEARNING OUTCOME

- Understanding the various agriculture products preparation.
- To teach the employment opportunities for processing industries.

THEORY

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

SEMESTER IV

22OAEV0434 PROCESSING OF ORGANIC AGRICULTURAL PRODUCES – 3 CREDITS

PRACTICAL SCHEDULE

1. Morphological characteristics of cereals
2. Physical and chemical properties of cereals
3. Parboiling of paddy, Cooking quality of rice and Milling of rice
4. Conditioning and milling Production of sorghum flakes
5. Production of popcorns, flaked rice, puffed rice, noodles
6. Preparation of sorghum malt
7. Processing of value added products from millets
8. Visit to processing unit (NICPT, Thanjavur)
9. Visit to National Institute for crop processing technology
10. Visit to commercial mini dhal and oil mills
11. Preconditioning of pulses and oilseeds before milling
12. Laboratory milling of selected pulses, oilseeds and its quality evaluation
13. Study of cooking quality of dhal, Processing of composite legume mix and preparation of value added products
14. Final Practical Examination

REFERENCES

1. Pandey, P.H (1996).Principles of Agricultural processing, Kalyani Publishers, Calcutta.
2. Chakraverty, A (2000). Third Edition. Post Harvest Technology of Cereals, pulses and oil seeds. Oxford and IBH publishing and co Pvt Ltd., New Delhi.
3. The Food Safety and Standards act, 2006 along with Rules and Regulations 2011, Commercial Law Publishers (India) Pvt.Ltd.

SEMESTER IV

22OAEV0435 PROCESSING OF ORGANIC HORTICULTURAL PRODUCES – 3 CREDITS

OBJECTIVES

- To learn about the scope and importance of value addition of horticultural crops.

LEARNING OUTCOME

- Understanding the various methods used in processing of fruits and vegetable crops.
- Studying the advantages and disadvantages of processing industries.

THEORY

Unit I **Introduction**: Production and processing scenario of fruits and vegetables in India. 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 machinery :** Manufacture of juices, squashes, syrups, sharbat, 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 and papain and value addition of fruits and vegetables

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

SEMESTER IV

22OAEV0436 PROCESSING OF ORGANIC HORTICULTURAL PRODUCES – 3 CREDITS

PRACTICAL SCHEDULE

1. Extraction and preservation of pulps and juices
2. Extraction and Preparation of jam
3. Extraction and Preparation of Jelly
4. Extraction and Preparation of RTS
5. Extraction and Preparation of Nectar and Squash
6. Preparation of osmotically dried products
7. Preparation of fruit bar and candy
8. Preparation of tomato products
9. Preparation of canned products
10. Applications of different types of packaging, containers for shelf life extension.
11. Effect of temperature on shelf life and quality of produce.
12. Demonstration of chilling and freezing injury in vegetables and fruits.
13. Visit to processing unit/ industry. (Nilakottai SIPCOT)
14. Final Practical Examination.

REFERENCES

1. Ranganna S, Handbook of Analysis and Quality Control for Fruit and Vegetable Products.
2. Patricia and Curtis A, An operational Text Book, Guide to Food Laws and Regualtions.
3. Avanthi Sharma, A text book of Food Science and Technology.
4. Dev Raj, Rakesh Sharma and Joshi V.K, Quality for Value Addition in Food Processing.
5. The Food Safety and Standards act, 2006 along with Rules and Regulations 2011, Commercial Law Publishers (India) Pvt.Ltd.

SEMESTER IV

EXPERIENTIAL LEARNING-IV

22OAEV0437 MUSHROOM CULTIVATION– 6 CREDITS

1. Introduction
2. Model production unit map
3. Varieties- Edible & Non-edible
4. Preparation of mushroom fungal culture
5. Preparation of mother spawn
6. Preparation of bed spawn
7. Mushroom bed preparation
8. Mushroom Production Technology
9. Post harvest Technology and Value addition
10. Visit to successful Mushroom grower farm
11. National Research Centre for Mushroom Cultivation (NRC)
12. Economics for mushroom production
13. Final Practical Examination

SEMESTER V

22OAEV0538 FARM POWER AND MACHINERY-3 CREDITS

Objectives

- To equip the students with sufficient theoretical Knowledge and practical skills about farm power and tractor power, implement resources used in agriculture, their cost of operation and selection.

Learning outcome

- Students equip with sufficient theoretical knowledge and practical skills about farm power and tractor power, implement resources used in agriculture, their cost of operation and selection.

THEORY

Unit I : **FARM POWER AND TRACTORS:** Form power in India – sources , IC engines – working principles, two stoke and four stoke engines, IC engine terminology ,different systems of IC engine . Tractors – types and utilities.

Unit II : **TILLAGE AND TILLAGE MACHINERY :** Tillage – ploughing methods – primary tillage implements – mould board , disc plough and chisel plough – Secondary tillage implements – cultivators, harrows and rotovators – wetland equipment – puddlers, tramplers and cage Wheels.

Unit III : **SOWING, PLANTING, AND INTERCULTURAL EQUIPMENT :** Sowing methods – seed drills , seed cum fertilizer drills – paddy transplanters – nursery requirements – implements for intercultural operations – wet land ,dry land and garden land intercultural tools.

Unit IV : **PLANT PROTECTION GADGETS, HARVESTING MACHINERY AND HORTICULTURE TOOLS:** plant protection equipment – harvesting tools and equipments – reapers and combine – harvesting machinery for groundnut , tuber crops and sugarcane – tools for horticultural crops.

Unit V : **EQUIPMENT FOR LAND DEVELOPMENT AND FARM MACHINERY SELECTION :** Equipment for land development and soil

conservation – cost of operation of farm machinery – Tractor and implement selection .

SEMESTER V

22OAEV0539 FARM POWER AND MACHINERY-3 CREDITS

PRACTICAL SCHEDULE

1. Different sources of farm power in India – human, animal, mechanical and electrical energy sources and their use in agriculture.
2. Working principles of two stroke and four stroke engines, applications – types, power and efficiency.
3. Explain the functions of tractor, identification of different components of tractor.
4. Different type of primary tillage implements and its applications.
5. Different type of secondary tillage implements and its applications
6. Explain the basic principle and functions of rotavator, puddler and cage wheels and its applications
7. Different type of sowing machineries and its applications.
8. Applications of dry land and wet land weeders.
9. Explain the basic principle and process of sprayers and its applications
10. Explain the basic principle and process of dusters and its applications.
11. Explain the basic principle and functions of paddy reaper and its applications.
12. Explain the basic principle and functions of combined harvester and its applications.
13. Explain the basic principle and functions of harvesting machinery for groundnut, tuber crops and sugar-cane and its applications.
14. Explain the basic principle and functions of dozers, levelers, JCB and its applications.
15. Selection of tractor and its implements and calculate the cost required for different agricultural operations.
16. Final Practical Examination

TEXT BOOKS

1. Senthilkumar , T., R.Kavitha and V.M.Duraisamy 2015. A TEXT BOOK OF FARM MACHINERY, Thannambikkai publications , Coimbatore. ISBN: 978-9381102305
2. Jagadishwar Sahay, 2010. ELEMENTS OF AGRICULTURAL ENGINEERING. Standard publishers Di9stributors, New Delhi. ISBN: (&*-818040440)

REFERENCE BOOKS

1. Ojha, T.P and A.M.Michael 2005. PRINCIPLES OF AGRICULTURAL ENGINEERING VOL I.jain Brothers, New Delhi. ISBN: 978-8186321638
2. Nakra C.P 1970. FARM MACHINERY AND EQUIPMENT : Dhanapat Rai publishing company Ltd, New Delhi ISBN :978-8187433231
3. Sricastava, A.c.,1991. ELEMENT OF FARM MACHINERY. Oxford and IBM publishing co Pvt Ltd, New Delhi.ISBN :978-8120405134

WEB RESOURCES:

1. WWW.agricoop.nic.in/dacdivision/Machinery/directory.htm
2. www.farmmachineryshow.org

SEMESTER V

22OAEV0540 ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS MANAGEMENT – 3 CREDITS

OBJECTIVE

- To develop and strengthen entrepreneurial quality and motivation among students.
- To impart basic entrepreneurial skills and understanding to run a business efficiently and effectively.

LEARNING OUTCOME

- Students will gain knowledge and skills needed to run a business

THEORY

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 V

22OAEV0541 ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS MANAGEMENT – 3 CREDITS

PRACTICAL SCHEDULE

1. Assessing Entrepreneurial traits
2. Problem solving skills of an Entrepreneur
3. Managerial skills of an Entrepreneur
4. Financial skills of an Entrepreneur
5. HRM skills of an Entrepreneur
6. Identification and selection of business idea
7. Preparation of Detailed Project Report (DPR)
8. Proposal writing for banking loan
9. Visit to Entrepreneurship development Institute (EDI)
10. Preparation of work chart for a agribusiness
11. Visit to TNAU –Directorate of Agribusiness Development
12. Knowledge about Start-ups – Agri-clinics
13. Final Practical Examination

REFERENCES

1. Mathew Manimala, Entrepreneurship Theory at the crossroads, Paradigms & Praxis, Biztrantra, 2nd Edition, 2005.
2. Prasanna Chandra. Projects- Planning, Analysis, Selection, Implementation and Reviews, Tata McGraw-Hill, 1996.
3. P.Saravanavel, Entrepreneurial Development, Ess Pee Kay Publishing House, Chennai-1997.
4. Donald F Kuratko, T.V.Rao. Entrepreneurship; A South Asian perspective Cengage Learning.2012.
5. Broadway, A.C. (2003). Text Book of Agri Business Management, Atlas Books and periodicals, New Delhi.
6. Kapur, S.K. (1994). Principles and Practice of Management, S.K. Publishers, New Delhi.
7. Prasad, L.M. (1993). Principles and Practice of Management, Sultan Chand & Sons, New Delhi.

SEMESTER V

22OAEV0542 ORGANIC LIVESTOCK AND POULTRY PRODUCTION-3 CREDITS

OBJECTIVES

- To teach the history, importance, concept and principles of organic livestock and poultry production.
- To train on feeding methods, health management, certification and conservation of Indigenous breeds and breeding methods.

LEARNING OUTCOME

- The students can understand the basic Importance, principles and need of organic livestock and poultry production.
- To acquire sufficient knowledge on health management and certification procedures.

THEORY

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 – principles of Organic Livestock production – Characteristics of an ideal organic livestock farm –Animal Welfare & Organic Agriculture – problems in 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 supplement- pasture management – species specific organic management practices – management practices specific to cattle, sheep, & 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 :** 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 – Mutilation –animal Nutrition – Veterinary medicine – Transport and Slaughter – list of Inspection and Certification Agencies of India – List of approved feed materials for animal nutrition –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.

SEMESTER V

22OAEV0543 ORGANIC LIVESTOCK AND POULTRY PRODUCTION -3 CREDITS

PRACTICAL SCHEDULE

1. Familiarizing with indigenous cattle
2. Familiarizing with indigenous buffalo
3. Familiarizing with indigenous sheep
4. Familiarizing with indigenous goat
5. Familiarizing with indigenous chicken breeds
6. Housing for organic milk production
7. Formulation of organic feeds for different class of animals
8. Formulation of feeds for different types of chicken
9. Formulation of Herbal feed additives
10. Formulation of ethno veterinary practices for common ailments
11. Practices hands on training on vaccination
12. Practices hands on deworming and dipping.
13. Final Practical Examination

REFERENCES

1. Banerjee, G.C., 2006. Text book of Animal Husbandry 8th Ed. 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 V

22OAEV0544 ORGANIC NORMS-2 CREDITS

Objectives

- To equip the students with studying the National norms prescribed for the organic production system to have a National Organic Guarantee System in our country.

Learning outcome

- The students learn about the National and International Norms available for production, processing and labeling of organic food products.
- Various other organic standards being followed in different countries.

THEORY

Unit I : **National Norms:** Introduction- Organic operator- Organic System Plan (OSP) – development of organic system plan- Basic requirements in an organic farm- Conversion requirements – duration of conversion period- landscape- choice of crops and varieties- diversity in crop protection and management plan- nutrient management, mixed farming, crop rotation, planting, manuring - Products that are permitted as manure in organic field, restricted products.

Unit II : **Pest, Disease and Weed management :** Products permitted for plant protection- Pest and Diseases management- Restricted products- Soil and water conservation- Contamination control- Organic Plant protection Products- Processing- Labeling- Packaging- Social justice- Documentation.

Unit III : **Certification:** Individual, Group and corporate certification- Internal control system, Participatory organic certification- National Standards for Organic Production- NSOP for Crop production and Animal Husbandry, Inspection and certification of organic products for export.

Unit IV : **International Norms:** Introduction- International Organic Standards- The IFOAM and Its Norms, IFOAM Basic Standards (IBS), IFOAM

Accreditation Criteria, The Codex Alimentarius Commission (CAC) Norms.

Unit V : **The European Unions (EU):**Council's Regulation on Organic Production- Japanese Agricultural Standards (JAS) - United States of America Organic Standards (National Organic Programme)- Comparison of EU, JAS and USDA Organic Standards- Private Certification in Some Countries- Certification and Inspection in Organic Farming.

REFERENCES

1. Kortbech- Olesen, R.(2000). Export Opportunities of Organic Food from Developing Countries. In World Organics, Agra Europe (London) Ltd, London, UK, 9-10 May 2000.
2. F.A.O. (2000). Food Safety and Quality as Affected by Organic Farming. Agenda item 10.1. In Twenty- Second FAO Regional Conference for Europe, Porto, Portugal, Food and Agriculture Organization of the United Nations, 24- 28 July 2000.
3. Willer, H. and M. Yussefi (Eds). (2006). The World of Organic Agriculture 2006- Statistics and Emerging Trends. 8th revised edition, February 2006, International Federation of Organic Agriculture Movements (IFOAM), Bonn, Germany.

SEMESTER V

22OAEV0545 FOOD SAFETY AND QUALITY STANDARDS-2 CREDITS

Objectives

- To provide an opportunity to learn food safety and quality in relation to organic production system.
- To gain knowledge about the national and international quality standards.

Learning outcome

- Student will understand about various quality management systems to be followed in organic certification and processing industries.
- This course will provide the students regarding various organizations/agencies that impose food safety regulations.

THEORY

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

REFERENCES

1. Gould, W.A. and Gould, R.W. 1988. Total Quality Assurance afor the Food Industries, CTI Publications Inc, Baltimore.
2. Gupta, A., Sharma, P.C. and Verma, A.K. (2010). Application of food safety, management system (HACCP) in food industry. *Indian Food Industry*, 29 (2) 39-46.
3. Bureau of Indian Standards, Manak Bhavan , 9 Bahadur Shah Zafar Marg, New Delhi-110002.
4. Jessica Vapnek and Melvin Spreij. 2005. Prespectives and guidelines on food legislation with a new model food law. developement law services FAO legal Office. FAO of the UN, Rome.
5. Margret Will and Doris Guenther (Eds). 2007. Food quality and safety standards as required by the EU law and private industry, 2nd Edition.

Website :

- http://ecoursesonline.iasri.res.in/course/view.php?id=109
- www.health.gov.au/internet/wcms/Publishing.nsf/Content/health-pubs-jetacar-cnt.htm/$FILE/jetacar.pdf Accessed 27 June 2005.

SEMESTER V

22OAEV0546 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, NGO's and allied areas in various regions. The students will gain first hand 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 Pattern

Educational tour (7 days)		
S.No.	**Parameters**	**Maximum Marks**
1	Written test	50
2	Record	10
3	Pocket notebook	10
4	Viva-voce	10
5	Behaviour	10
6	Attendance	10
	Total	**100**

SEMESTER V

EXPERIENTIAL LEARNING-V

22OAEV0547 NURSERY MANAGEMENT TECHNOLOGIES – 6 CREDITS

1.Establishment of nursery

- **Selection of site**
- **Product choice**

2. Nursery Structures

- **Structures required**
- **Land preparation**

3. Management of nursery

- Nursery bed preparation
- Cultural practices
- Export and packing
- Commercial plants

4. Cost of development of ornamental nursery

- Establishment and maintenance of mother plants
- Establishment of Pot Nursery
- Establishment of seed bed nursery
- Equipments, Implements & Furniture
- Wages for skilled labourer for budding, grafting, etc. @ Rs.100/- per manday

6. Protray Nursery Technique

SEMESTER VI

22OAEV0648 OPERATIONAL GUIDELINES FOR DOCUMENTATION - 4 CREDITS

OBJECTIVES

- The importance of ICS in Group Certification.
- Role of Internal audit for different quality system.
- Documents and records maintained by organic growers.

LEARNING OUTCOME

- The students able to learn about the documentation, internal audit and record keeping of organic certification including organic logo.

THEORY

Unit I : **National Programme for Organic Production:** Organic agriculture-organic agriculture and regulatory systems-organic certification-National programme for organic production (NPOP)-certification process-inspection procedure-Grower Group Certification (GGC)-India organic trade mark logo.

Unit II : **Operational structure of National Organic Programme :** Introduction-scope-operational structure- organizational setup**.** National Standards for Organic Production **(NSOP):** Organic crop production- organic livestock, poultry and products-organic bee keeping-organic aquaculture production-organic food processing and handling.

Unit III : **Accreditation of certification bodies:** Accreditation criteria-categories of accreditation- principles-inspection and certification-certification- Accreditation procedure-conditions for imposing sanctions-guidelines for equivalency recognition and conformity assessment recognition with trading partner countries.

Unit IV : **Guidelines for certification of grower groups:** Scope- constitution and development of the Internal Control System(ICS) - Internal standards-conflict of interest-scope of certification-trade-procedures for implementation of ICS-operating document- Internal inspection-internal approvals- External inspectors by accredited certification bodies-yield estimates-Non-compliances and sanctions-Training of farmers- buying procedures- storage and handling procedures-processing.

Unit V : **Organic Certification Mark:** Organic logo- specifications-concept of organic logo-regulations governing use of the certification- trade mark ‘ India Organic Logo’- license application procedure-grant and Conditions of a license- fees-undertaking-surveillance and regular review-Use of certification trade mark-publicity- Obligations of the applicant- surrender of license-powers of the accredited certification body-Misuse of license- appeals.

REFERENCES

1. IFOAM/IOIA (2001). International Organic Inspection Manual
2. National Programme for Organic Production (2005). Department of Commerce, Ministry of Commerce and Industry, New Delhi.

3. Various International Standards (EU regulation, USDA, JAS etc.)

22OAEV0649 FARM INSPECTION AND CERTIFICATION PROCEDURE- 4 CREDITS

OBJECTIVES

- To be acquainted with inspection procedures of organic management system.
- To be familiarized with (CCP) in organic operation and risk assessment procedure.
- To be familiarized with the regulations for the grant of license to use this logo and significance of organic logo.

LEARNING OUTCOME

- The students able to learn about the importance of farm inspection and certification procedure

THEORY

Unit I : **Procedures of Inspection-** Introduction- General concept about Inspection- Basics of Inspection, Requirements for Inspection, Key steps in the Inspection Procedure, Check Lists for Inspection.

Unit II : **Hazard Analysis and Critical Control Points (HACCP) and Critical Control Points (CCP):** General introduction to HACCP and CCP, Organic Critical Control Points at different stages, Risk Assessment, Organic crop protection strategies- Submission of Inspection Report.

Unit III : **Chain of Custody :** Chain of custody and Relevant Guidelines- Definition and concept, IFOAM Guidelines on Certification scope and chain of custody, NPOP guidelines on chain of custody- Requirement for Chain of custody certification.

Unit IV : **Checklists for Farm Inspection and Certification:** Importance of checklist- Necessity , areas to be considered for checklist- Checklists and Its use- Checklist as an Inspection tool, Checklist for Organic farm inspection, checklist required for grower group, checklist required for wild harvest, checklist on Handling/ Processing, Checklist for Animal Husbandry.

Unit V : **Formats for documentation:** Introduction- Documents to be maintained by farmers- Farm and field maps, field history sheet, activity register, input record, harvest record, storage record, sales record, pest control record, labeling records, soil testing record- Other additional documents required at farm level- format for different certificates and required at farm level- Format for different certificates and request for issue- Livestock records- Formats for group certification.

REFERENCES

1. IFOAM/IOIA (2001). International Organic Inspection Manual

2. National Programme for Organic Production (2005). Department of Commerce, Ministry of Commerce and Industry, New Delhi.
3. Various International Standards (EU regulation, USDA, JAS etc.)

SEMESTER VI

22OAEV0650 ITKs IN ORGANIC FARMING– 2 CREDITS

OBSERVATION

- To teach the students about the scope and importance of ITKs in organic farming.
- To learn about the practices and collection of ITKs.

LEARNING OUTCOME

- The students can understand about the practices and identify the different methods of Indigenous Technical Knowledge and collection of ITKs.

THEORY

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

Unit II **Collection and Documentation of ITK:** Need for collection and documentation of ITK – Sources of ITK, Primary and Secondary sources – drawing a sample – Identifying the indigenous specialists – procedures to be followed in recording ITK. 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 **ITKs 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 **ITKs 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 **Ethno Veterinary Practices (EVP) on Livestock Management:** Livestock

Health Systems, Digestive, circulative, nervous, excretory, respiratory and dermal systems. Common disorders and ailments commonly practiced EVPs for treatment

SEMESTER VI

22OAEV0651 ITKs IN ORGANIC FARMING– 2 CREDITS

PRACTICAL SCHEDULE

1. Identification of sources for collection of ITKs
2. Practicing different methods of collecting ITKs
3. Documentation of ITKs on Field crops
4. Documentation of ITKs on Field crops
5. Documentation of ITKs on horticultural crops
6. Documentation of ITKs on horticultural crops
7. Documentation of ITKs on Plant protection in Field crops
8. Documentation of ITKs on Plant protection in Horticultural crops
9. Documentation of ITKs on general agriculture and storage practices
10. Documentation of EVPs on livestock management.
11. Documentation of EVPs on livestock management.
12. Final Practical Examination

REFERENCES

1. Sundaramari,M. (2003). Indigenous Agricultural Practices for Sustainable Farming, Agrobios (India), Jodhpur.
2. Ketho Vimera. (2014)Indigenous Technical Knowledge- Its relevance in the present day farming with cases of your choice; Agriculture officer, Government of Nagaland; in post Graduate Diploma in Agricultural Extension Management, a paper presentation, MANAGE, HYDERABAD.
3. Dewalt,B.R. (1994). Using Indigenous Knowledge to improve agriculture and Natural Resource Management.

22OAEV0652 INSPECTION AND CERTIFICATION OF ORGANIC PRODUCES- 2 CREDITS

OBJECTIVES

- To explain the purpose and application of ICS training in organic farming.
- To state the functioning of the farmers in an organic grower group and assess the features of a certified organic farm.

LEARNING OUTCOME

- The students able to learn about the responsibility of organic inspector to protect organic integrity.

PRACTICAL SCHEDULE

1. Visit and study of grower group
2. Procedures for the study of grower group
3. Observation and result
4. Report preparation and submission
5. Study on internal control system (ICS)
6. Procedures for the study on internal control system (ICS)
7. Observation and result
8. Report preparation and submission
9. Visit to certified organic farm
10. Procedures for the study on certified organic farm
11. Observation and result
12. Report preparation and submission
13. Final Practical Examination

REFERENCES

1. IFOAM/IOIA (2001). International Organic Inspection Manual
2. National Programme for Organic Production (2005). Department of Commerce, Ministry of Commerce and Industry, New Delhi.
3. Various International Standards (EU regulation, USDA, JAS etc.)

SEMESTER VI

22OAEV0653 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.

SEMESTER VI
22OAEV0654 FIELD PLACEMENT TRAINING – 4 CREDITS

Field placement training with organic related Agro- industries/ NGOs for a period of 15 days. The students should collect the data relevant to the organic farming. The details of practicals learnt by the students in field placement training to be documented, presented and submitted for evaluation.

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

Evaluation Pattern

Organic related agro Industry/ NGO (15 days)		
S.No.	**Parameters**	**Maximum marks**
1	Participation	10
2	Input preparation	10
3	Marketing skills	10
4	Demonstration on nearby villages	10
5	Observation note book	10
6	Chart preparation (15days activities with photos)	10
7	Documentation and report submission	10
8	Oral Presentation	10
9	Behaviour	10
10	Attendance	10
	Total	**100**

SEMESTER VI

EXPERIENTIAL LEARNING-VI

22OAEV0655 APICULTURE TECHNOLOGY – 6 CREDITS

1. Importance of Honeybee in Agriculture
2. Introduction and History of Beekeeping
3. Beekeeping in India
4. General Morphology and Anatomy
5. Bee Biology
6. Pollinating plants and their cycle
7. Bee conservation
8. Commercial methods of bee rearing, Equipments used and Seasonal management of bees
9. Bee hives and their description
10. Honeybee Castes
11. Bee Pasturage
12. Bee Foraging
13. Bee Behaviour
14. Bee Communication
15. Dances of Honeybees
16. Enemies – Insect pests and diseases of Honeybees and their management
17. Final Practical Examination